

# *The LADIES' Diary:*

OR

## WOMAN'S ALMANACK,

For the Year of our LORD 1787;

Being the Third after BISSEXTILE, or LEAP-YEAR.

Containing New Improvements in ARTS and SCIENCES,

And many Entertaining PARTICULARS:

Designed for the *Use* and *Diverſion* of the

## FAIR-SEX.

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The Eighth ALMANACK Published of this Kind.

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VIRTUE and SENSE, with FEMALE-SOFTNESS joined,  
(ALL that subdues and captivates Mankind !)  
In BRITAIN's Matchless FAIR resplendent shine:  
THEY rule LOVE's Empire by a Right Divine:  
Justly their Charms the astonish'd World admires,  
Whom Royal CHARLOTTE's bright Example fires.



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L O N D O N :

Printed for the COMPANY of STATIONERS,  
And sold by ROBERT HORSFIELD, at their Hall in Ludgate-Street.  
[Price stitched, NINE-PENCE.]

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<i>T. of Christ.</i>	<i>Ts. since.</i>	<i>T. of Christ.</i>	<i>Ts. since.</i>
1600 King Charles I. born	187	1714 Q. Ann died, K. Geo. I. succ.	7
1603 Q. Eliz. died, K. Ja. succ.	184	1715 Rebellion in the north	7
1603 A great Plague in London	184	1716 A very great frost	7
1605 Popish Gun-powder Plot	182	1726 Sir Isaac Newton died	6
1616 Shakspeare the poet died	171	1727 K. Geo. I. died, Geo. II succ.	6
1625 K. James died, Cha. I. succ.	162	1739 War against Spain declared	4
164 Bloody Irish massacre	146	1739 A very great frost	4
1642 Sir I. Newton born Dec. 25	145	1743 A great comet appeared	4
1649 K. Charles I. beheaded	138	1744 War against France declared	4
1658 Oliver Cromwell died	129	1745 Rebellion in Scotland	4
1660 K. Charles II. restored	127	1748 A general peace	3
1662 Royal Society instituted	125	1750 Westminster bridge finished	3
1665 Died of the plague 68,586	122	1752 Date and Calendar altered	3
1666 Great fire in London	121	1756 War against France declared	3
1666 War against Denmark decl.	121	1780 K. Geo. II. died, G. III. succ.	2
1667 Peace with Hol. Fr. & Den.	120	1762 American philos. soc. Instit.	2
1672 War against Holland decl.	115	1762 War against Spain declared	2
1672 Halfpence & Farth. coined	115	1763 Peace with France & Spain	2
1674 Peace with Holland procl.	113	1765 Otaheite discovered	2
1674 Habeas Corpus act passed	108	1770 Blackfriars bridge finished	1
1685 K. Cha. II. died, Ja. II. succ.	102	1772 A revolution in Denmark	1
1688 Prince of Orange landed	99	1772 A revolution in Sweden	1
1688 K. James II abdicated	99	1775 War against America begun	1
1689 Wm. and Mary crowned	98	1776 America declared independent	1
1693 Hackney coaches established	94	1778 French treaty with America	1
1702 K. Wm. died, Q. Ann succ.	85	1778 War against France begun	1
1702 War against France declared	85	1779 War against Spain begun	1
1707 England & Scotland united	80	1780 War against Holland begun	1
1713 Peace with France procl.	74	1783 A general peace	1

BIRTH-DAYS, [N.S.] and YEARS, of the ROYAL FAMILY of GREAT BRITAIN.

KING GEORGE III. June 4, 1738	Prince Adolph. Fred. Feb. 24, 1774
Prince of Wales, August 12, 1762	Princess Mary, April 25, 1776
Prince Frederick, August 16, 1763	Princess Sophia, Nov. 3, 1777
Prince William Henry, Aug. 21, 1765	Princess Amelia, Aug. 7, 1782
Prs. Charl. Aug. Mat. Sept. 29, 1766	Queen Charlotte, May 19, 1744
Prince Edward, Nov. 2, 1767	Prs. Amelia, June 10, 1711
Prs. Augusta Sophia, Nov. 8, 1768	Prs. Augusta of Brunsw Aug. 11, 1737
Prs. Elizabeth, May 22, 1770	Duke of Gloucester, Nov. 25, 1742
Prince Ernest Augustus, June 5, 1771	Duke of Cumberland, Nov. 7, 1742
Prince Aug. Fred. Jan. 2, 1772	

YEARS OF BIRTHS of the Principal SOVEREIGN PRINCES of EUROPE.

Achmet IV. Grand Seigneur 1715	Joseph Ben. Aug. Emp. Germ. 1741
Charles. King of Spain, 1716	Fred. William, King of Prussia, 1744
Pius VI. Pope 1717	Gustavus, King of Sweden, 1746
Victr. Amad. Maria K. Sardinia 1726	William V. Stadtholder, 1748
Catherine, Empress of Russia, 1729	Christian VII K. of Denmark, 1745
Stanislaus Aug. King of Poland 1731	Ferdinand IV. King of Sicily, 1751
Maria, Queen of Portugal 1734	Lewis XVI. King of France, 1754

Full Moon 3d, 47m. past 11 night.  
 Last Quarter, 11th, 52m. past 6 morn.  
 New Moon, 19th, 47m. past 10 morn.  
 First Quarter, 26th, 12m. past 5 aftern.

Sun enters 19d. 12h. 59m.

1	M	Circumcision	8	53	55	23	s	0	5	m	26	1
2	Tu			4	56	22		55	6		35	1
3	W			3	57			49	D	rises		F
4	Th			3	57			43	4	a	52	16
5	F	Old Christmas Day		2	58			36	6		16	17
6	S	Epiphany: Twelfth-day		1	59			29	7		37	18
7	G	1 Sunday after Epiph.		0	4	0		21	8		55	19
8	M	Lucian: Plow Monday	7	59		1		13	10		10	20
9	Tu			58		2		5	11		21	21
10	W			57		3	21	56	morn			22
11	Th			56		4		47	0		30	23
12	F	Old New-Year's Day		55		5		37	1		42	24
13	S	Hilary: Cam. Ter. beg.		54		6		27	2		50	25
14	G	2 Sunday after Epiph.		53		7		16	3		57	26
15	M	Orf. Term begins		52		8		5	4		59	27
16	Tu			51		9	20	54	5		53	28
17	W	Old Twelfth Day		49		11		42	6		39	29
18	Th	Queen's B. day kept. Prisca		48		12		30	7		12	30
19	F			47		13		17	D	sets		N
20	S	Fabian. Hilary, 1 Ret.		45		15		4	5	a	46	32
21	G	3 S. aft. Epiph. Agnes		44		16	19	51	7		1	33
22	M	Vincent		42		18		37	8		19	34
23	Tu	Hilary Term begins		41		19		23	9		36	35
24	W			40		20		9	10		54	36
25	Th	Conversion of St. Paul		38		22	18	54	morn			37
26	F			37		23		39	0		15	38
27	S	Pr. Aug. F. b. 1773. Hil. 2R.		35		25		24	1		37	39
28	G	4 Sunday after Epiph.		33		27		8	2		59	40
29	M			32		28	17	52	4		12	41
30	Tu	K. Cha. I. mart. 1649		30		30		36	5		13	42
31	W			28		32		19	6		31	43

Days	L. of D.		Day Inc.	D. breaks		Tw. ends		Sun East		Cl. bef. S.		Stars	Sc
1	7	50	0	6	0	6	0	4	41	4	7"	8	a 44
6		58		14	5	58	2		43	6	25		22
11	8	8		24		54	6		46	8	30		10
16		18		34		49	11		49	10	19	7	39
21		32		48		44	16		53	11	51		18
26		46	1	2		38	22		58	13	4	6	56

Full Moon, 2d, 15m. past noon.

Last Quarter, 10th, 48m. past 3 morn.

New Moon, 18th, 17m. past 2 morn.

First Quarter, 24th, 49m. past midnight.

Sun enters ♋

18d, 3h. 50m.

M	W	Sundays, Holydays, &c.	Sun rises	Sun sets	Sun's decl.	D rises & sets	D's Age
1	Th		7 27	4 33	17° 2'	6m 39	14
2	F	Purif. or Candlemas-day	25	35	16 44	D rises	F
3	S	Blase. Hilary, 3 Return	23	37	27	6 a 19	16
4	G	Septuagesima Sunday	22	38	9	7 38	17
5	M	Agatha	20	40	15 51	8 53	18
6	Tu		18	42	32	10 5	19
7	W		16	44	14	11 18	20
8	Th		14	46	14 55	morn	21
9	F	Hilary, 4th Return	13	47	36	0 27	22
10	S		11	49	16	1 36	23
11	G	Sexagesima Sunday	9	51	13 56	2 41	24
12	M	Hilary Term ends	7	53	36	3 39	25
13	Tu	Old Candlemas-day	5	55	16	4 28	26
14	W	Valentine	3	57	12 56	5 9	27
15	Th		1	59	35	5 39	28
16	F		0	5	15	6 3	29
17	S		6 58	2 11	54	6 23	30
18	G	Quinqua. or Shrove Sun.	56	4	33	D sets	N
19	M		54	6	11	7 a 17	2
20	Tu	Shrove Tuesday	52	8	10 50	8 39	3
21	W	Ash Wednesday	50	10	28	10 1	4
22	Th		48	12	6	11 24	5
23	F	[1774]	46	14	9 44	morn	6
24	S	St. Matthias. Pr. Ad. Fr. b.	44	16	22	0 47	7
25	G	1 Sunday in Lent	42	18	0	2 4	8
26	M		40	20	8 37	3 8	9
27	Tu		38	22	15	3 59	10
28	W	Ember Week	36	24	7 52	4 37	11

Days	U. of D.	Day 1bc.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars So.
1	9	6	1 22	5 31	6 29	5 4	14 5" 6 a 33
6		24	40	24	37	9	33 12
11		42	58	16	45	14	41 5 52
16	10	0	2 16	7	54	20	29 33
21		20	36	4 58	7 3	26	13 59 14
26		40	56	49	12	32	14 4 55

N<sup>o</sup> 84.

March hath xxxi Days.

Full Moon, 4th, 5 m. past 1 morn.  
 Last Quarter, 11th, 54 m. past midnight.  
 New Moon, 19th, 48 m. past 2 aftern.  
 First Quarter, 26th, 8 m. past 8 morn.

Sun enters  $\gamma$   
 zod. 4h. 14m

1	Th	David	6	34	5	26	7	s	29	5	m	7	1
2	F	Cbad		32		28			7	5		30	1
3	S			30		30	6		44	5		49	1
4	G	2 Sunday in Lent		29		31			21			Drises	1
5	M			27		33	5		58	7	a	46	1
6	Tu			25		35			34	8		59	1
7	W	Perpetua		23		37			11	10		14	1
8	Th			21		39	4		48	11		23	1
9	F			19		41			24			morn	2
10	S			17		43			1	0		30	2
11	G	3 Sunday in Lent		15		45	3		37	1		30	2
12	M	Gregory		13		47			14	2		23	2
13	Tu			11		49	2		50	3		4	2
14	W			9		51			26	3		38	2
15	Th			7		53			3	4		8	2
16	F			5		55	1		39	4		31	2
17	S	St. Patrick		3		57			15	4		52	2
18	G	4 or Midle. S: Ed.K.W.S.		1		59	0		52	5		9	2
19	M		5	59	6	1			28			D sets	N
20	Tu			57		3			4	7	a	46	2
21	W	Bened. a		55		5	on	20	9	12			3
22	Th			53		7			43	10		36	4
23	F			51		8	1		7	11		56	5
24	S			49		11			30			morn	6
25	G	5 S. in Lent, Annunc. or		47		13			54	1		7	7
26	M	[Lady Day		45		15	2		18	2		2	8
27	Tu			43		17			41	2		44	9
28	W			41		19	3		4	3		18	10
29	Th			39		21			28	3		43	11
30	F	Cambr. Term ends		37		23			51	4		2	12
31	S	Drif. Term ends		35		25	4		14	4		19	13

Days	L. of D.		Day Inc.		D.breaks		Tw. ends		Sun East	Cl. bef. S.		7 Stars So.			
1	10	51	3	8	4	44	7	17	5	36	12	40	4	a	44
6	11	10		26		33		29		42	11	33			26
11		30		46		22		40		48	10	17			8
16		50	4	6		12		50		55	8	51		3	49
21	12	10		26		2	8	1	6	1	7	21			31
26		30		46		3		13		7		48			13



Full Moon, 2d, 23m. past 4 aftern.  
 Last Quarter, 10th, 3m. past 8 even.  
 New Moon, 18th, 18m. before 1 morn.  
 First Quarter, 24th, 58m. past 3 aftern.

Sun enters 8  
 19d. 16h. 56m.

1	G	5 S. in Lent. Palm Sunday	5	33	6	27	4n	37	4m	45	14
2	M			31		29	5	1	D	rises	F
3	Tu	Richard		29		31		24	8	a	3
4	W	St. Ambrose		27		33		46	9		14
5	Th	Old La. day Maundy Thurs.		25		35	6	9	10		23
6	F	Good Friday		23		37		32	11		25
7	S			21		39		54		morn	20
8	G	Easter Day		19		41	7	17	0		22
9	M	Easter Monday		17		43		39	1		8
10	Tu	Easter Tuesday		16		44	8	1	1		46
11	W			14		46		23	2		16
12	Th			12		48		45	2		40
13	F			10		50	9	7	3		1
14	S			8		52		29	3		20
15	G	1 S. af. Easter. Low Sun.		6		54		50	3		37
16	M			4		56	10	12	3		56
17	Tu			2		58		33	4		16
18	W	Orf. and Cam. T. begin		0	7	0		54		D	sets
19	Th	Alphege	4	58		2	11	15	9		42
20	F			57		3		35	10		59
21	S			55		5		56		morn	
22	G	2 Sunday after Easter		53		7	12	16	0		2
23	M	St. George. East. T. 1 re.		51		9		36	0		51
24	Tu			49		11		56	1		24
25	W	St. Mark. Prs. Maryb. 1776.		47		13	13	15	1		54
26	Th	[East. T. beg.		45		15		35	2		16
27	F			44		16		54	2		32
28	S			42		18	14	13	2		50
29	G	3 Sunday after Easter		40		20		31	3		7
30	M	Easter Term 2 return		38		22		50	3		23

Days	L. of D.		Day Inc.	D. breaks		Tw. ends		Sun East		Cl. bef. S.		7 Stars So.			
1	12	54	5	10	3	33	8	28	6	15	3	56"	2	3	51
6	13	14		30	2	1		40	21		2	27			33
11		32		48		6		55	27		1	2			14
16		52	6	8	2	54	9	7	33		0	a	16	1	56
21	14	10		26		40		21	39		1	25			37
26		30		46		25		37	44		2	23			18

Full Moon, 2d, 38m. past 7 morn.  
 Last Quarter, 10th, 45m. past 11 morn.  
 New Moon, 17th, 43m. past 8 morn.  
 First Quarter, 23d, 56m. past midnight.  
 Full Moon, 31st, 16m. past 11 night.

Sun enters II  
 zod. 17h. 27m.

1	Tu	St. Philip and James	4	37	7	23	15	n	8	3	m	40	14
2	W			35		25			26	D	rises	F	
3	Th	Invention of the Cross		33		27			44	9	a	21	16
4	F			31		29	16		1	10		19	17
5	S			30		30			19	11		11	18
6	G	4 S. af. East. 7. Ev. a. P. L.		28		32			35	11		51	19
7	M	Easter Term 3 return		26		34			52		morn		20
8	Tu			25		35	17		8	0		22	21
9	W			23		37			25	0		47	22
10	Th			21		39			40	1		9	23
11	F			20		40			56	1		27	24
12	S	Old May Day		18		42	18		11	1		43	25
13	G	5 S. af. East. Rogat. S.		17		43			26	2		1	26
14	M	Easter Term 4 return		15		45			41	2		21	27
15	Tu			14		46			55	2		42	28
16	W			12		48	19		9	3		11	29
17	Th	Ascension, Holy Thurs.		11		49			23	D	sets	N	
18	F	Easter Term 5 return		9		51			36	9	a	47	2
19	S	Q. Char. b. 1744. Dunstan.		8		52			49	10		43	3
20	G	Sunday after Ascension		7		53	20		1	11		25	4
21	M	Easter Term ends		5		55			14	11		57	5
22	Tu	Prs. Eliza. born 1770		4		56			26		morn		6
23	W			3		57			37	0		21	7
24	Th	Corf. Term ends		1		59			49	0		40	8
25	F			0	8	0	21		0	0		57	9
26	S	Augustin	3	59		1			10	1		13	10
27	G	Whit Sunday. Ven. Bede		58		2			20	1		29	11
28	M	Whit Monday		57		3			30	1		48	12
29	Tu	K. Cha. II. restored 1660		56		4			39	2		8	13
30	W	Ember Week		55		5			49	2		33	14
31	Th			54		6			57	D	rises	F	

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars S.
1	14 46	7 2	2 7	9 55	6 50	3' 8"	o a 59
6	15 4	20	1 52	10 10	55	39	40
11	20	36	30	33	7 0	56	21
16	36	52	7	56	4	4 0	1
21	50	8 6	0 32	11 38	8	3 50	11 m 42
26	16 2	18	No real Night		12	25	22

Last Quarter, 8th, 35m. past 11 night.  
 New Moon, 15th, 50m. past 3 aftern.  
 First Quarter, 22d, 45m. past 11 morn.  
 Full Moon, 30th, 38m. past 2 aftern.

Sun enters  $\infty$   
 21d. 2h. 6m.

1	F	Nicomede	3	53	8	7	22	n	6	D	rises	16
2	S			52		8		13	9	a	48	17
3	G	Trinity Sunday [T. 1 re.		51		9		21	10	22		18
4	M	K. Geo. III. b. 1738. Trin.		50		10		28	10	49		19
5	Tu	Pr. Er. Aug. b. 1771. Bon. f.		49		11		35	11	11		20
6	W	Orf. Term begins		49		11		41	11	29		21
7	Th	Corpus Christi		48		12		47	11	47		22
8	F	Trinity Term begins		47		13		53	morn			23
9	S	[1711]		47		13		58	0	4		24
10	G	1 S. af. Tri. Prs. Ame. b		46		14	23	3	0	21		25
11	M	St. Barnabas. Tri. T. 2 re.		45		15		7	0	40		26
12	Tu			45		15		11	1	4		27
13	W			44		16		15	1	36		28
14	Th			44		16		18	2	15		29
15	F			44		16		20	D	fets	N	
16	S			44		16		21	9	a	16	2
17	G	2 Sun. af. Trin. St. Alban		43		17		25	9	50		3
18	M	Trin. Term 3 return						26	10	17		4
19	Tu							27	10	39		5
20	W	Transf. Edw. K. W. Sax.						28	10	58		6
21	Th	Longest Day						28	11	15		7
22	F							28	11	30		8
23	S							27	11	48		9
24	G	3 S. af. Tri. Na. J. Bapt.						26	morn			10
25	M	Trinity Term 4 return		43		17		25	0	8		11
26	Tu			44		16		23	0	32		12
27	W	Trinity Term ends		44		16		21	1	1		13
28	Th			44		16		18	1	39		14
29	F	St. Peter		44		16		15	2	25		15
30	S			45		15		12	D	rises	F	

Longest Day at Lond.  
 is 16h. 34m. 4sec.  
 allowing 9m. 16sec.  
 for refraction.

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	2l. aft. S	Stars S	
1	16	14	8	30	7	15	2' 39"	10 m 57
6		22		38		18	1 49	37
11		30		46		19	0 53	17
16		32		48		20	0 b 9	9 53
21		34		50		21	1 13	35
26		32	ode. 2			20	2 17	15



Last Quarter, 7th, 6m. past 8 even.  
 New Moon, 14th, 58m. past 10 night.  
 First Quarter, 22d, 8m. past 1 morn.  
 Full Moon, 30th, 7m. past 5 morn.

Sun enters  $\Omega$   
 22d. 12h. 55m.

1	G	4 Sunday after Trinity	3	45	8	15	23	n	8	a	46	1
2	M	Visitation of Virgin Mary		46		14		4	9	10	16	
3	Th	Dog Days beg. Cl. Com.		46		14	22	59	9	31	1	
4	W	Translation of St. Mart. n		47		13		54	9	49	2	
5	Th	Old Midsummer day		48		12		48	10	6	21	
6	F	Cam. Term ends		48		12		42	10	22	22	
7	S	Thomas a Becket		48		11		36	10	40	2	
8	G	5 Sunday after Trinity		50		10		30	11	0	24	
9	M	Oxford Act		51		9		25	11	29	25	
10	Tu			51		9		15	morn		26	
11	W			52		8		7	0	2	27	
12	Th			53		7	21	59	0	48	28	
13	F			54		6		5	1	50	2	
14	S	Off. Term ends		55		5		42	D sets	N		
15	G	6 Sun. af. Trin. Swithin		56		4		32	8 a	13	1	
16	M			58		2		2	8	37	2	
17	Tu			58		1		1	8	56	3	
18	W		4	0		0		2	9	15	4	
19	Th			1	7	59	20	51	9	32	5	
20	F	Margaret		2		58		46	9	50	6	
21	S			4		56		2	10	8	7	
22	G	7 Sun. af. Trin. Magda'len		5		55		17	10	52	8	
23	M			6		54		5	10	50	9	
24	Tu			7		53	19	52	11	34	10	
25	W	St. James		9		51		38	morn		11	
26	Th	St Anne		10		50		26	0	17	12	
27	F			12		48		1	1	10	13	
28	S			13		47	18	59	2	11	14	
29	G	8 Sunday after Trinity		15		45		45	3	19	15	
30	M			16		44		31	D rises	F		
31	Tu			18		42		16	7 a	53	17	

Day	dec.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	Stars So.
1	16 30	0 4		7 19	3' 18'	8 m 54
6	24	10		18	4 13	34
11	16	18	No real Night	15	4 59	13
16	4	30		13	5 33	7 53
21	15 52	42		9	5 55	33
26	10	54	0 44	11 13	6 3	12

Last Quarter, 8th, 35m. past 11 night.  
 New Moon, 15th, 50m. past 3 aftern.  
 First Quarter, 22d, 45m. past 11 morn.  
 Full Moon, 30th, 38m. past 2 aftern.

Sun enters  $\infty$   
 21d. 2h. 6m.

1	F	Nicomede	3	53	8	7	22	n	6	D	rises	16
2	S			52		8		13	9	a	48	17
3	G	Trinity Sunday [T. 1 re.		51		9		21	10	22		18
4	M	K. Geo. III. b. 1738. Trin.		50		10		28	10	49		19
5	Tu	Pr. Er. Aug. b. 1771. Bon f.		49		11		35	11	11		20
6	W	Orf. Term begins		49		11		41	11	29		21
7	Th	Corpus Christi		48		12		47	11	47		22
8	F	Trinity Term begins		47		13		53	morn			23
9	S	[1711		47		13		58	0	4		24
10	G	1 S. af. Tri. Pres. Ame. b.		46		14	23	3	0	21		25
11	M	St. Barnabas. Tri. T. 2 re.		45		15		7	0	40		26
12	Tu			45		15		11	1	4		27
13	W			44		16		15	1	36		28
14	Th			44		16		18	2	15		29
15	F			44		16		20	D	sets	N	
16	S			44		16		2	9	a	16	2
17	G	2 Sun. af. Trin. St. Alban		43		17		25	9	50		3
18	M	Trin. Term 3 return						26	10	17		4
19	Tu							27	10	39		5
20	W	Transf. Edw. K. W. Sax.						28	10	58		6
21	Th	Longest Day						28	11	15		7
22	F							28	11	30		8
23	S							27	11	48		9
24	G	3 S. af. Tri. Na. J. Bapt						26	morn			10
25	M	Trinity Term 4 return		43		17		25	0	8		11
26	Tu			44		16		23	0	32		12
27	W	Trinity Term ends		44		16		21	1	1		13
28	Th			44		16		18	1	39		14
29	F	St. Peter		44		16		15	2	25		15
30	S			45		15		12	D	rises	F	

Longest Day at Lond.  
 is 16h. 34m. 4sec.  
 allowing 9m. 16sec.  
 for refraction.

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun Ent	El. aff. S	Stare S
1	16	14	8	30			
6		22		38	7	15	10 m 57
11		30		46		2' 39"	
16		32		48		1 49	37
21		34		50		0 53	17
26		32	ode. 2			0 b 9	9 58
					21	1 13	35
					20	2 17	15

No night, but  
 constant day  
 or twilight.

Last Quarter, 7th, 6m. past 8 even.  
 New Moon, 14th, 58m. past 10 night.  
 First Quarter, 22d, 8m. past 1 morn.  
 Full Moon, 30th, 7m. past 5 morn.

Sun enters ♍  
 22d. 12h. 55m.

1	G	4 Sunday after Trinity	3	45	8	15	23	n	8	a	46	1
2	M	Visitation of Virgin Mary		46		14		4	9	10		10
3	Th	Dog Days beg. C.R.Com.		46		14	22	59	9	31		1
4	W	Translat-on of St. Mart.n		47		13		54	9	49		2
5	Th	Old Midsummer day		48		12		48	10	6		21
6	F	Cam. Term ends		48		12		42	10	22		22
7	S	Thomas a Bicket		4		11		36	10	40		2
8	G	5 Sunday after Trinity		50		10		30	11	0		24
9	M	Oxford Act		51		9		25	11	29		25
10	Tu			51		9		15	morn			26
11	W			52		8		7	0	2		27
12	Th			53		7	21	59	0	48		28
13	F			54		6		5	1	50		2
14	S	Oxf. Term ends		55		5		42	D	fets	N	
15	G	6 Sun. af. Trin. Switwin		56		4		32	8	a	13	1
16	M			58		2		2	8	37		2
17	Tu			59		1		12	8	50		3
18	W		4	0		0		2	9	15		4
19	Th			1	7	59	20	51	9	32		5
20	F	Margaret		2		58		40	9	50		6
21	S			4		56		2	10	8		7
22	G	7 Sun. af. Trin. Magdalen		5		55		17	10	32		8
23	M			6		54		5	10	50		9
24	Tu			7		53	19	52	11	34		10
25	W	St. James		9		51		30	morn			11
26	Th	St Anne		10		50		26	0	17		12
27	F			12		48		1	1	10		13
28	S			13		47	18	59	2	11		14
29	G	8 Sunday after Trinity		15		45		45	3	19		15
30	M			16		44		31	D	rises	F	
31	Tu			18		42		16	7	a	53	17

Day	dec.	D.breaks	Tw. ends	Sun East	Cl. bef. S.	Stars So.
1	6 30	0 4		7 19	3 18	8 m 54
6	24	10		18	4 13	34
11	16	18	No real Night	15	4 59	13
16	4	30		13	5 33	7 53
21	15 52	42		9	5 55	33
26	10	54	0 44	11 13	6 3	12

Last Quarter,	6th, 36m. past 2 aftern.	Sun enters $\pi$ 22d. 19h. 17m.
New Moon,	13th, 6m. past 7 morn.	
First Quarter,	20th, 26m. past 5 aftern.	
Full Moon,	28th, 19m. past 6 even.	

1	W	Lammas Day	4	19	7	41	18	n	1	8	a	11	18
2	Th			21		39	17		46	8		28	19
3	F			22		38			30	8		44	20
4	S			24		36			14	9		5	21
5	G	9 Sunday after Trinity		26		34	16		58	9		30	22
6	M	Transfiguration		27		33			42	10		0	23
7	Tu	Prs. Amelia b. 1783. Name		29		31			25	10		42	24
8	W	[of Jesus]		31		29			8	11		36	25
9	Th			32		28	15		51			morn	26
10	F	St. Lawrence [Days end		34		26			33	0		44	27
11	S	Prs. Brunf. b. 1737. Dog		36		24			15	2		3	28
12	G	10 S. af. Tri. Pr. Wales b.		37		23	14		58	3		27	29
13	M	[O. Lam. day		39		21			39			D sets	N
14	Tu			41		19			21	7	a	19	2
15	W	Assumption		43		17			2	7		39	3
16	Th	Pr. Fred. born 1763		45		15	13		43	7		57	4
17	F			46		14			24	8		17	5
18	S			48		12			5	8		38	6
19	G	11 Sunday after Trinity		50		10	12		45	9		3	7
20	M			52		8			25	9		37	8
21	Tu	Pr. Wm. Hen. b. 1765		54		6			6	10		16	9
22	W			55		5	11		45	11		6	10
23	Th			57		3			25			morn	11
24	F	St. Bartholomew.		59		1			5	0		5	12
25	S		5	1	6	59	10		44	1		8	13
26	G	12 Sunday after Trinity		3		57			23	2		18	14
27	M			5		55			2	3		31	15
28	Tu	St. Augustine		7		53	9		41			D rises	F
29	W	Beheading of John Baptist		9		51			20	6	a	40	17
30	Th			10		50	8		58	6		59	18
31	F			12		48			27	7		18	10

No.	L. of D.	Day dec.	D. breaks	Lw. ent	Sun East	Cl. per S.	S. as. o.
1	5	22	1	12	1	22	10 35 7 0 5' 54" 6 m 49
6		6		28		42	15 6 54 5 29 30
11	14	48		46	2	0	9 57 50 4 50 11
16		30	2	4		18	40 45 3 56 5 52
21		12		22		33	25 39 2 49 33
26	1	54		40		48	10 24 1 12 15



Last Quarter,	4th,	21m. past 8 even.	
New Moon,	11th,	8m. past 5 aftern.	Sun enters ♈
First Quarter,	19th,	9m. past noon.	22d. 15h. 47m.
Full Moon,	27th,	20m. past 6 morn.	

1	S	Gues	5	14	40	0	15	7	4	41	20
2	G	13 S.a. Tri. Lon. bur. 1666		16	44	7	53	8	11	21	
3	M			18	42		31	8	49	22	
4	Tu			2	4			9	37	23	
5	W			22	38	6	46	10	39	24	
6	Th			24	36	24	11	53		25	
7	F	Enurcheus		26	34		2	morn		26	
8	S	Nativity of the V. Mary		28	32	5	39	1	14	27	
9	G	14 Sunday after Trinity		30	30		16	2	35	28	
10	M			32	28	4	54	3	57	29	
11	Tu			34	26		31	D sets	N		
12	W			35	25		8	6	a 8	1	
13	Th			37	23	3	45	6	27	2	
14	F	Holy-Cross		39	21		22	6	47	3	
15	S			41	19	2	59	7	14	4	
16	G	15 Sunday after Trinity		43	17		35	7	45	5	
17	M	Lambert		45	15		12	8	22	6	
18	Tu			47	13	1	49	9	8	7	
19	W	Ember Week		49	11		26	10	1	8	
20	Th			51	9		2	11	3	9	
21	F	St. Matthew		53	7	0	39	morn		10	
22	S	K. Geo. III. crown. 1761		55	5		15	0	11	11	
23	G	16 Sunday after Trinity		57	3	s	8	1	21	12	
24	M			59	1		31	2	34	13	
25	Tu	Old Holy Rood	6	1	5	59	55	3	48	14	
26	W	St. Cyprian		3	57	1	18	5	4	15	
27	Th			5	55		42	D rises		16	
28	F	[M. bo. 1766		7	53	2	5	5	a 55	17	
29	S	St. Michael. Prs. Ch. Aug.		9	51		2	6	26	18	
30	G	17 S. aft. Trin. St. Jerome		11	49		52	7	c	19	

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun Bat	Cl. per. S	Stars So.								
1	13	32	3	2	3	5	8	54	6	27	0	14	4	m	53
6		12		22		19		40		21	1	50			35
11	12	52	1	42		32		27		14	23	33			17
16		34	4	0		43		16		8	25	18	3		59
21		14		20		54		5		2	7	2			42
26	11	54		40	4	5		7	51	5	36	8	45		22



Last Quarter, 14th, 30m. past 2 morn.  
 New Moon, 11th, 53m. past 5 morn.  
 First Quarter, 19th, at 8 morning.  
 Full Moon, 26th, 24m. past 5 aftern.

Sun enters m  
 22d. 23h. 45m.

1	M	Remigius	6	13	5	47	3	15	7	a	45	20
2	T			15		45		39	8		43	21
3	W			17		43	4	2	9		53	22
4	Th			19		41		25	11		8	23
5	F			21		39		48	morn			24
6	S	Faib		23		37	5	11	0		31	25
7	G	18 Sunday after Trinity		25		35		34	1		51	26
8	M			27		33		57	3		9	27
9	T	St. Denys		28		32	6	20	4		26	28
10	W	St. and Cam. T. beg.		30		30		43	5		42	29
11	Th			32		28	7	6	D	fets	N	
12	F			34		26		29	5	a	25	2
13	S	Trans. of K. Edw. Conf.		36		24		51	5		53	3
14	G	19 Sunday after Trinity		38		22	8	14	6		27	4
15	M			40		20		36	7		10	5
16	T			42		18		58	8		0	6
17	W	Etheldred		44		16	9	20	9		0	7
18	Th	St. Luke		46		14		42	10		3	8
19	F			48		12	10	4	11		11	9
20	S			50		10		25	morn			10
21	G	20 Sunday after Trinity		52		8		47	0		22	11
22	M			54		6	11	8	1		34	12
23	T			55		5		29	2		48	13
24	W			57		3		50	4		3	14
25	Th	K. Geo. III. Acces. Crisp.		59		1	12	11	5		22	15
26	F	K. Geo. III. Procl. 1760	7	1	4	59		32	D	rises	F	
27	S			3		57		52	5	a	1	17
28	G	21 S.a. Tri. St. Simon and		5		55	13	12	5		45	18
29	M	[Jude]		7		53		32	6		41	19
30	T			9		51		52	7		48	20
31	W			10		50	14	12	9		5	21

Days	.. of D.	Day.	dec.	D.	breaks	Tw.	ends	Sun East	Cl.	after S.	7 Stars	So.	
1	11	34	5	0	4	17	7	42	5	52	10	22	3 m 6
6		14		20		28		31		44	11	52	2 48
11	10	56		38		38		21		37	13	14	29
16		36		58		48		11		31	14	22	17
21		16	6	18		57		2		25	15	16	1 52
26	9	58		36	5	6	6	53		19	15	53	31

Last Quarter, 2d, 5m. past 10 morn.  
 New Moon, 9th, 42m. past 9 night.  
 First Quarter, 18th, 7m. past 3 morn.  
 Full Moon, 25th, 26m. past 4 morn.

Sun enters 2  
 21d. 20h. om.

1	Th	All Saints	7	12	48	14	31	10	2	2
2	F	Pr. Edw. b. 1767. <i>All Soul.</i>	14	46	50	11	45	2	2	2
3	S	Prs. Soph. b. Mic. T. i ret.	16	44	15	9	morn	24		
4	G	22 Sunday after Trinity	18	42	28	1	2	2		
5	M	Powder Plot, 1605	19	41	46	2	19	26		
6	Tu	<i>Leonard.</i> Mich. Ter. beg.	21	39	16	4	3	33	2	
7	W	Duke of Cumb. b. 1745	23	37	22	4	47	28		
8	Th	Prs. Aug. Soph. bo. 1768	24	36	39	5	58	20		
9	F	Ld. Mayor's Day at Lond.	26	34	57	7	lets	N		
10	S		28	32	17	14	4	26	1	
11	G	23 S. af. Tri. <i>St. Martin</i>	30	30	30	5	7	2		
12	M	Mich. Term 2 return	31	29	47	5	55	3		
13	Tu	<i>Britius</i>	33	27	18	3	6	51	4	
14	W		34	26	19	7	52	5		
15	Th	<i>Macbutus</i>	36	24	34	8	58	6		
16	F		37	23	49	10	5	7		
17	S	<i>Hugh Bp. of Lincoln</i>	39	21	19	4	11	15	8	
18	G	24 Sunday after Trinity	40	20	18	morn		9		
19	M	Mich. Term 3 return	42	18	52	0	27	10		
20	Tu	<i>Edmund</i>	43	17	46	1	39	11		
21	W		45	15	29	2	53	12		
22	Th	<i>Cecilia.</i> Old Mart. day	46	14	13	4	10	13		
23	F	<i>St. Clement</i>	47	13	2	5	29	14		
24	S	[ <i>Catharine</i>	49	11	37	6	53	15		
25	G	25 S. af. Tri. D. Glou. b.	50	10	49	Drise		F		
26	M	Mich. Term 4 return	51	9	31	1	5	26	17	
27	T		52	8	12	6	41	18		
28	W	Mich. Term ends	54	6	23	8	4	19		
29	Th		55	5	33	9	25	20		
30	F	<i>St. Andrew</i>	56	4	43	10	44	21		

Days	L. of D	Day dec.	D. break	Tw. ends	Sun East	Cl. aft. S.	7 stars Su	
1	9	36	6 58	5 15	6 46	5 13	16' 14"	1 m 0
6		18	7 16	22	37	7	16 9	0 50
11		0		34	30	2	15 44	30
16	8	46		48	35	4 57	14 57	9
21		30	8 4	42	18	53	13 49	11 2 44
26		18		16	48	12	12 21	23

Last Quarter, 1st, at 8 evening.  
 New Moon, 9th, 11m. past 4 evening.  
 First Quarter, 17th, at 8 evening.  
 Full Moon, 24th, 14m. past 3 afternoon.  
 Last Quarter, 31st, 56m. past 8 morning.

Sun enters ♊  
 21d. 8h. 22m.

1	S		7	57	4	3	21	52	morn	22
2	G	Advent Sunday		58		2	22	1	0	23
3	M			59		1		18	1	24
4	Tu			0		0		18	2	25
5	W			1		59		26	3	26
6	Th	Nicholas		2		58		33	4	27
7	F			2		58		40	5	28
8	S	Conception of V. Mary		3		57		46	7	29
9	G	2 Sunday in Advent		4		56		52	D fets	30
10	M			4		56		58	4 a	31
11	Tu			5		55	23	3	5	32
12	W			5		55		7	6	33
13	Th	Lucy		6		54		12	7	34
14	F			6		54		15	8	35
15	S			7		53		19	10	36
16	G	3 S. in Adv. O'ap. Cam.		7		53		21	11	37
17	M	Off. T. ends [T. ends		7		53		24	morn	38
18	Tu			8		52		25	0	39
19	W	Ember Week						27	1	40
20	Th							28	2	41
21	F	St. Thomas. Shortest Day						28	4	42
22	S							28	5	43
23	G	4 Sunday in Advent						27	6	44
24	M							26	D rises	45
25	Tu	Christmas Day						25	5 a	46
26	W	St. Stephen						23	6	47
27	Th	St. John						20	8	48
28	F	Holy Innocents						18	9	49
29	S							1	10	50
30	G	Sunday after Christmas						10	morn	51
31	M	Silvester						6	0	52

Day	of D.	Day dec	D. break	Tw. ends	Sun East	Cl. aft. S	Stars S.
1	8	6	8 28	5 54	6 6	4 46	10 35
6	7	56	38	57	3	43	8 33
11		50	44	58	2	41	6 19
16		46	48	59	1	40	3 55
21		44	50	6 0	0	39	1 26
26		46	52	50	1	40	1 bef. 5

CHRONOLOGICAL NOTES, &c. in 1787.

Dominical Letter	-	-	G	Shrove Tuesday	-	Feb. 20.
Golden Number	-	-	2	Easter Day	-	Apr. 8.
Epact	-	-	11	Whit-Sunday	-	May 27.
Cycle of the Sun	-	-	4	Trinity-Sunday	-	June 3.
Roman Indiction	-	-	5	Advent-Sunday	-	Dec. 12.

ECLIPSES, &c.

THERE will be six eclipses this year, viz. 3 of the sun, and 3 of the moon, and four of them will be visible.—I. A visible eclipse of the moon begins Jan. 3d. at 10 at night, and ends 35m. past 1 next morning; the digits eclipsed 21.—II. A visible eclipse of the sun begins Jan. 19th, at 9h. 54m. in the morning, and ends at 12m. past 11; the digits eclipsed 1½.—III. The sun is visibly eclipsed June 15th; begins 4h. 12m. afternoon, and ends 5h. 47m.; the digits eclipsed 5½.—IV. An invisible eclipse of the moon happens June 30th, near half past 2 in the afternoon.—V. An invisible eclipse of the sun Dec. 9th, near a quarter past 4.—VI. An eclipse of the moon Dec. 24, partly visible; begins 1h. 42m. afternoon, ends 4h. 32m.; and the moon rises eclipsed at 3h. 52m.; digits eclipsed 9½.

VENUS is a morning star till Oct. 18; and afterwards an evening star.

JUPITER is an evening star till May 24; then a morning star till Dec. 13; then an evening star again for the rest of the year.

ANSWERS to the ENIGMAS.

1 Diphthong	4 Spurs	7 U	10 Corn
2 Jealousy	5 Halfpenny	8 Great Coat	11 Nut-crackers
3 The Moon	6 Something	9 Wig	12 or Prize, Shadow.

4 Sonnet to Emma, on receiving a letter with her Shade en-profile.

By R. TATTAM, Esq.

MY Emma's likeness I requested;  
(An emblem of her love I said)

With many a constant vow protested;  
The fair one sent inclos'd her *shade*.

But where's my Emma's jetty eye?  
That sparkled as the diamond bright:  
The locks that round her bosom lye?  
The bosom too as as lilly white?

Some jealous doubts my faith disarms:  
Why send the shadow of those charms?  
How often has my Emma swore,  
Not Sappho lov'd her Phaon more.  
Those vows are witness'd by the powers above,  
Then is a shade an emblem of your love.

Though fortune's sun propitious smile,  
Yet life at best's a transient day:  
The morn is bright, yet clouds e'er while  
May soon obtrude the noon-tide ray.

Say, should misfortune's cloud pervade,  
Would Emma's love then prove a shade.

But hark ! majestic reason cries,  
(For soon she pierc'd the thin disguise)

Some happier swain shall catch the wily maid,  
While Edwin fondly clasps the faithless shade.

*The Prize Enigma answered by E. W.*

Delia, I've seen, (tho' strange 'tis strictly true)  
A form as fair, as elegant, as you :  
Of equal grace possess'd, and equal ease,  
To charm the fancy, or the eye to please :  
A face illum'd with all your beauty's blaze ;  
And on *that* face 'twas no offence to gaze :  
A smile as pleasing, eyes as full of fire ;  
Of fire, not quite so dang'rous to admire :  
So the sun's rays more tolerably beam,  
Reflected in the mirror of the stream.  
As lately near a crystal stream you stray'd,  
This beauteous form was to my view display'd ;  
You view'd it not, for you avert your eye,  
When such fair vehicle of flattery's nigh.  
But some *fage* swain, possess'd of ample store,  
Of deep, dark, dubious, enigmatic lore,  
Might *guess*, as near the azure stream you stood,  
I view'd your floating *shadow* in the flood :  
Gods ! what a *guess* ! to crown such *skill* divine,  
Be his the *shadow*, and the *substance* mine.

*The same by Mrs. B. of Salisbury.*

When Judah's king the awful sentence heard,  
"Thine house in order set, for thou shalt die ;"  
The scripture says, the monarch greatly fear'd,  
And to his gracious God did humbly cry.  
His Pray'r was heard, a lengthen'd time was given,  
The *shadow* shew'd the royal grant from heav'n.

*The same by Ecclesiæ.*

"Frail man the vision of a day was made :  
Dream of a dream ; a *shadow* of a shade."

*The same by Mr. Alex. Rowe, of Reginnis.*

"When the fair son of fortune gilds our days,  
When affluence all her dazzling charms displays ;  
A crowd of sycophants our steps attend,  
Profess regard, and all the real friend :  
But when the prospect turns to sad decay,  
They, like a faithless *shadow*, flee away."



*The Prize Enigma answered by Mr. T. Eland.*

When faithful sol retires to western skies,  
When shadows vanish, and when shades arise,  
I court the sun-shine of my Delia's eyes.

*The same by Miss Emily Rivers.*

As o'er the heath the guilty Edwin	Short will thy triumph be ; thy joys
stray'd,	[ray'd, are past ; [ne'er can last ;
Before him stood, in airy form ar-	Too soon thou'lt find such pleasures
Fair Emma's pallid shade.	And much the deed deplore.
In hollow sounds it cry'd " false	Then, taught by me, those paths no
man behold [told :	more pursue, [cause to rue :
In me the victim to the tales you	Which lead to crimes all must have
Ah ! poor deluded maid.	Repent—but hark !—no more—

The clock struck twelve ; the phantom shook its head :  
Thrice crow'd the cock : the fleeting shadows fled.

*The same by Bidfordiensis.*

In darkness I wander'd a while,	But thought bid the prospect to
The prize in thick clouds lay con-	smile,
ceal'd ;	And shade became clearly reveal'd.

*Mr. Rob. Richardson's Address to Miss Betty Smales.*

Heroic fair, the palm be thine ;	Scorn the base wretch whose fickle
Thou to thy sex a mirror be ;	Shadows prefer to solid joy ; [heart,
Superior thus still ever shine	Contemtuousspurn the urchin's dart,
O'er falsehood and inconstancy.	And pleasures chuse that never cloy.

*The same answered by Mr. John Watkins of Bidford.*

Human life is short and frail ;	So our lives are quickly done.
Soon is done the fleeting tale ;	Death insatiate soon appears,
As the shadow's swiftly gone,	Ends our days and ends our cares.

*The same by Mr. Tho. Herod of North Creak, Norfolk.*

Ye beauteous fair in Britain's isle,	Tho' truth at first his words appear,
Beware of the gay flatt'rer's smile,	You'll quickly find them light as
And all his wiles evade ;	And empty as a shade. [air,

We are truly sorry that our limits will not permit us to insert more of the many ingenious and separate answers that are given by Messrs Algenor, Ex Ambrose, Wm Anderson, Jn Aspland, W P B, T B, T Baker, Ja Barton, Bayley, Wm Bearcroft, Jn Bransby, Miss Augusta A Brown, Miss Diana Browne, W P Burman, Jn Burrow, F C, Tho Cock, Tho Crawler, W W Crowle, Rd Dening, Devonienfis, J B Digby, G Dixon, Rob. Dowden, Elixa, W Evans, W Exall, P Fidler, Jn Fildes, P Fip, A G, Wm Gale, P Gotterson, Gradus, I H, Geo Harris, Jn Harvey, Rob Hendy, Higolilly, J Hunt, Jacobus de wiredi Sylva, J Jackson, Tho Jackson, J Kimbell, Laconicus, Wm Lambeth, H Lee, Jn Lowry, I M, Miss Eugenia Maitland, Mrs D Mason, H Mellanby, Cba Metcalfe, a Methodist, Miss F Morrall, Tho. Moulfson, Miss Diana Myrtle, Tom Mystry, Tho Nield, an Old Man near Ely, Jn Needbam, Ja Palmer, I Peck jun, Wm Penn, Philadelphia, Philander, Philarithmus, Rd Pidghy Esq; Pb Russer, Wm Simpson jun, Miss Rosebud, Fr Smith, Miss

*Snell, Wm Swift, Sylvia, Miss Tomboy, I Townsend, Tusio, H Vice, Cha Wal-  
ker, J Walton, Kit Went, Tom Whitter, Tho Woolston, &c.*

*All the Enigmas answered by the Rev. Mr. T. Baker:*

ADVICE TO YOUTH.

<p>While <i>spur'd</i> by warm and youthful blood, You pleasures court as the chief good Of mortals here below : Let friendship kindly now dictate, How to avoid the wretched fate Which from this source will flow. From midnight revels keep away, Where Bacchus rules with sov'reign And mischiefs vile attend ; [sway, Left prompted by th'intemp'rate god, Your dagger drink the vital blood Of your most valu'd friend. Next shun the harlot's false embrace, Where <i>jealousy</i> with smiling face, And poignant evils dwell : Tho' all Arabia's sweets thou'd shed, Their fragrance o'er her <i>powder'd</i> Her ways lead down to hell. [head, Shou'd you have gold and rich array, She'll ev'ry <i>farthing</i> draw away, To aggrandize her state. Your coat, your <i>bat</i> and <i>wig</i> off born, She'll leave you wretched and forlorn, To mourn your hapless fate.</p>	<p>Know, wintry age will soon come on, And all your <i>shadow</i>-joys be gone, When conscience, like a fiend, Will hourly haunt your guilty breast, Nor sun nor moon will see you rest ; In pain your days will end. But wou'd you taste of real joy, And pleasures that will never cloy, Still walk in virtue's ways ; Keep the celestial maid in sight, She'll lead you to the realms of light, And crown with bliss your days. Serene your hours will calmly glide, And peace will ever at your side A constant guest remain ; Shou'd earth be from its basis hurld, And ruin <i>crush</i> a trembling world, You will the shock sustain. Reflect on this ye tho'tless, who Ideal forms of bliss pursue ; Reflect ere 'tis too late ; Recede from vice's dang'rous lure, In time make your election sure, Or think what ills await.</p>
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*The Happy Pair, by Mr. Isaac Saul, of Holland, near Wigan.*

<p>On yonder hill, with <i>shade</i> of green, A shepherd's little cot is seen ; Where Colin and his faithful wife, Together lead a happy life. <i>Nothing</i> e'er makes them disagree ; They <i>spurn</i> the thoughts of <i>jealousy</i> : Contented with their humble lot, They never wish to quit their cot ; Nor yet repine at partial fate, That has not made them rich and great, With health and freedom ever blest, No <i>farthing</i> care they for the rest ; As <i>fashions</i>, honour, fame, renown, Or all the wealth below the moon. He, like a fop, does ne'er look big,</p>	<p>In cock'd up <i>bat</i> and powder'd <i>wig</i>; Nor yet for dainties do they pine ; Or plain, but wholesome, fare they dine ; As milk and butter, <i>bread</i> and cheese ; Or garden roots and herbs will please. Yet they at Christmas never fail, To treat their friends with <i>nuts</i> and ale ; And other things for th' season fit, Which mirth and harmony beget ; While joke or chearful song goes round, No place for discontent is found. Say then do you, ye rich, e'er find More real joys, or peace of mind,</p>
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*Miss Tamboy's Answer to the Enigmas.*

What theme, what numbers shall I chuse?  
 I'm lost in thought—assist me muse;  
 Inspire me with the power to write  
 The dark enigmas all to light.  
*Dipthong* and *jealousy* appear;  
 And many more are in the rear.

*Spurs, wig, coat, something, moon*; what  
 Can possibly admit this train? [*strain*  
*Nutcrackers, halfpenny, and cern,*  
 Can such a trio verse adorn?  
 Words so inimical to verse,  
 Require some genius to rehearse.  
 Without delay I quit the field  
 To abler hands. I yield, I yield.

*The same by Mr. Tho. Truswell, of Nuneaton.*

Hither ladies fair and blooming,  
 Haste and walk the meadows gay;  
 Now the gales are all-perfuming,  
 Taste, o taste the sweets of May.  
 See the shady woods and mountains,  
 Lofty pines and leafy shades,  
 Purling rills and chrysal fountains,  
 Gently fall in soft cascades.  
 Hither come, soft spring invites you,  
 Where the gentle breezes play;  
 Beauteous scenes will here delight  
 Haste from folly, haste away. [you.  
 Here, no *jealous* thought arising,  
 In the harmless shepherd's breast,  
 All such factious tales despising,  
 Peace inspires his soul to rest.  
 Here no envious passion teazes,  
 Here no censure *spurs* the mind;

Nature still delights and pleases,  
 All benevolent and kind.  
 O'er the rising hill comes peeping,  
 Phebus to salute the morn;  
 Leaving idle sluggards sleeping,  
 Shooting lustre o'er the lawn.  
 When at eve his head's declining,  
 And in Thetis lap do lie,  
 Then bright *Luna's* beams are shining  
 Thro' the bright etherial sky.  
 Studios minds in contemplation  
 Seek the *wheaten* fields and groves;  
 Pleas'd to view the gay creation,  
 Headless of *bat*, or *coat*, or gloves.  
 Whilst the baneful harlot's starving,  
*Something* here delights the soul;  
 Heed then not a single *farthing*,  
 Friendship's charms delight the whole

*On Jealousy: by Miss Diana Browne, of Honiton, Devon.*

What happy days were once my lot,  
 E'er *jealousy* disturb'd my cot!  
 When I rejoic'd each year to see  
 The springing *corn* the blooming tree.  
 But now, alas! those days are o'er,  
 And pleasure's banish'd from my door.  
 If I've new *petticoat* or *tete*,  
 Spousy's all over in a fret;  
 Groundless suspicion tears his brain,

And passing *shadows* give him pain.  
 If I but laugh, or *crack* a jest;  
 Silence, says he, becomes you best.  
*Money*, he swears, he'll give me none:  
 Lord keep me from the jealous drone:  
 Surely the *moon* disturbs his pate,  
 That makes him *spurn*, and curse  
 his fate.  
 Unhappy me!—I'll try my skill —  
 I vow I'll either cure or kill.

*The Enigmas answered by Mr. Wm. Bearcroft, of Newton.*

With trembling hand I once again  
 Attempt your riddles to explain;  
 And if I have constru'd 'em right,  
 Pray put my piece in black—and  
 white.  
 I'm *jealous* that some long-*wig'd*  
 critic,  
 Well-vers'd in matters analytic,

May say that *something, moon*, and  
*dipthong*,  
 Likewise the letter *u* in triphthong,  
 Are too obtruse for poet-afters  
 T' investigate before their masters;  
 And that *spurs, pence*, and new *nut-*  
*cracks*, [cracks,  
*Corn, shadows, coats*, and such gim-

Much better suit our empty notions,  
Then letters, light, and heavenly  
motions.  
True—but then an itch for scribbling  
Many a witling sets a nibbling

At things, which, tho' they do but  
lame, [fame.  
Yet fickle chance sometimes gives  
So, tho' I'm none of those call'd wife,  
Yet may, by chance, obtain the prize.

*The same by T. B. of Shaftsbury.*

With powder'd wig, and buckl'd shoe  
The beau may view his shade,  
And think his coat of copper hue  
Will tempt the jealous maid.

But no such fops 'ere crack a joke  
At chaste Diana's shrine,  
For to the Gods she always spoke  
For something more divine.

*The same by Gradus, of Canterbury.*

When first I began  
Your enigmas to scan, [ceed;  
Something told me I shou'd not suc-  
But soon after I spied  
Lovely Cynthia, and cried  
O now I'm spur'd on to proceed.  
Ev'n yet I'm in doubt  
Of making all out, [brains:  
They're so dark that they puzzle my  
But as I've begun,  
I'll a diphtbong name one,  
And a halfpenny get for my pains.

But if Lady Di,  
Next year when I try, [dress'd,  
I perceive they more slender are  
I'll still try my wit,  
Your true meaning to hit;  
If I'm wrong, I shall give u my best.  
Your indulgence I need,  
While I further proceed,  
To expound what are yet in disguise;  
But a wig and a nut,  
I believe may be put,  
And a shadow must sure be the prize.

*The same by Mr. Jonathan Hornby, of Westerdale.*

Poets oft long extend their plan;  
But I'll answer all as short as I can;  
That every one may have his doom,  
And leave for each a piece of room.

The first three may be answer'd  
soon,  
By diphtbong, jealousy, and moon,

Spurs, halfpenny, something, letter u,  
Bring out 4 more to public view;  
And then coat, wig, wheat, and nut-  
cracks, [lacks,  
Shew the 4 next. Then there but  
The prize, a shadow you may view,  
So ladies till next year adieu.

*The same by Eugenio.*

Again the muse resumes her annual strain,  
To solve the mist'ries of Diaria's train;  
Bids the pale moon, fair regent of the night,  
Of shades develop'd, boast her silver light.

From peruke, coat, and spurs removes the veil,  
And something shews Diaria would conceal.

But how shall she unite in one soft strain  
The grating nutcracks and the golden grain;  
Or deck old halfpence out in colours new,  
A present meet, ye lovely fair, for you.

Tho' jealousy awhile escap'd her fight,  
The muse now drags her dreaded form to light:  
Like vice "a monster of such frightful mien,  
As to be hated needs but to be seen;"

1  
3  
12  
9, 8, 4  
7  
11, 10  
5  
7  
2

A vulture keen that, seizing on the heart,  
 Insatiate revels on its noblest part;  
 Riots on hope, love, peace, and virtue fair,  
 Then leaves the wretched bosom to despair.

*Mr. T. Eland's Address to Miss Smales.*

Oh! why, my dear Betsey, doth <i>jealousy</i> reign	2
In your bosom, or give you one moment of pain?	
Why doubt of my passion, why think me untrue?	
The flame of desire <i>spurs</i> me only to you.	4
No miser more anxious his <i>pence</i> to increase,	5
Than I to behold and restore you to peace;	
With eager impatience I look for the day,	
That shall join <i>U</i> and I by love, honour, obey,	7
And complete a new <i>diphthong</i> the old fashion'd way.	1
Believe me, dear madam, my <i>corn</i> and my wine,	10
My hand and my heart I with pleasure resign;	
No <i>shadow</i> of doubt need your bosom invade,	12
No fear, if I live, of your dying a maid.	
The <i>moon</i> as she wanders may vary her face,	3
Now frown with grim aspect, now smile with a grace:	
Not so your admirer; he'll steadily move	
In one circle of kindness, of friendship and love;	
With warmth of affection perform every duty,	
Buy <i>nutcracks</i> "to ease your supporters of beauty."	11
With <i>wig</i> nicely powder'd, and <i>coat</i> a la mode,	9, 2
<i>Something</i> whispers my pride, you will think me a lord.	6
But alas, after all this long story is told,	
Perhaps your pretended affection's grown cold,	
Or have yielded your hand to a miser and gold.	
Should either alarming conjecture prove true,	
Be pleas'd to inform me: till then ma'am adieu.	

*All the Enigmas answered by Mr. Philip Rusher.*

The shades of night had lull'd the world to rest,	
And, <i>wrapp'd</i> in sleep, his bed the lab'rer prest;	8
The <i>moon</i> alone reveal'd a feeble light,	3
And tipt with glim'ring <i>shadow</i> ev'ry height;	12
The waving <i>corn</i> bent gently to the breeze,	10
That sweetly murmur'd thro' the whisp'ring trees. —	
I left my cot, by contemplation drawn,	
And cross'd the flow'ry mead and verdant lawn;	1
My steps directing to a rock that stood	
Enbosom'd in the centre of a wood;	
From whence a stream with soothing murmurs steals,	
And gives its crystal waves to neighb'ring vales.	
Here as I stood, with pensive thoughts oppress'd,	
A sudden voice my wondering ear confess'd:	7



"Hence I fly this place, it said, or seem'd to say,  
 Where none but hopeless minds consent to stray;  
 Incited by despair, on this dire spot  
 My ruthless hand my own destruction wrought.  
 Thy once lov'd friend, thy Constantine am I,  
 A victim *spur'd* to death by *jealousy*.  
 A dreadful *something* urg'd me to my fate,  
 Tho' crack'd my heart-strings in the dire debate.  
 A faithless wretch my better sense deceiv'd,  
 The well-coin'd lie I fatally believ'd:  
 And thinking truth had left the tender maid,  
 I sought grim death beneath this twiggy shade.  
 O may'st thou learn from my sad destiny,  
 To shun the fatal ill of *jealousy*."

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2

*An Eligy to the Memory of a poor but learned Acquaintance,  
 by Mr. Tho. Woolston.*

1. Adieu ye flatt'ring scenes by fancy feign'd;  
 No more of fortune *jealous* I complain;  
 No more of partial smiles by me arraign'd;  
 For folly laughs, and wisdom cries 'tis vain.
2. Oft by the *moon's* pale beam at silent eve,  
 With painful eyes I turn'd whole volumes o'er;  
 Anxious each wasted moment to retrieve,  
 The sacred springs of learning to explore.
3. *Spur'd* on by hope, the distant prospect smil'd;  
 With trembling step, impel'd, I mov'd along;  
 That *something* unpossess'd, my heart beguil'd;  
 I sigh'd to shine above the vulgar throng.
4. But ah! how vain the fond desire to shine,  
 When fortune turns her cheering smiles away;  
 For tho' inspir'd by all the tuneful nine,  
 In drear oblivion sleeps the tuneful lay.
5. Poor Alcon knew no academic bowers,  
 Where genius foster'd fair expands its bloom;  
 The care for daily bread o'ercast his hours,  
 And tied his hands to labour in the loom.
6. Yet, ardent to enrich his ample mind,  
 Not poverty could weigh his genius down;  
 Leaving the fetter'd forms of schools behind,  
 He made the lore of Greece and Rome his own.
7. But what avail'd his strong desire to know!  
 To Sappho's sweetness tho' his notes aspire,  
 Or chaste as Virgil though his periods flow,  
 Hesperian fancy join'd with Attic fire!
8. For fortune, reckless of his modest worth,  
 Ne'er deign'd poor Alcon one propitious smile,  
 Nor patron rais'd to call his genius forth;  
 But left him *penniless*, unknown, to toil.

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9. No modish coat, or fine exotic hair 8, 9  
 He ever own'd, tho' oft they add high grace;  
 These, tho' the wittlings most important care,  
 By fawning arts he wins a gainful place.
10. There cracks his nuts and frothy jokes at ease, 11  
 Or talks of crops — no matter, he is sped — 10  
 With indignation pining merit sees,  
 That scorns the servile task to fawn for bread.
- 11, Peace to his gentle shade — for now no more 12  
 Poor Alcon wants those favours, once deny'd;  
 With fortune now th' unequal conflict's o'er —  
 In cold obscurity he sunk and died.

We have had this year a vast profusion of other ingenious answers, and are most sincerely concern'd that our narrow limits compel us to dis-appoint so many ingenious correspondents, who have favoured us with their compositions, viz. Messrs *Wm Anderson, W P B, T Barker, Jn Bay-ley, Mrs Baufor, Jn Bransby, Nic Breach, Miss Augusta A Brown, J Bur-row, J Campbell, Tho Cock, Jos Cowing, W W Crowle, Jn Cullyer, M D, R Dening, J Burr Digby, G Dixon, Rob Dowden, Eliza, W Evans, W Exall, Jn Fildes, Mat Fleck, W Gale, Rob Hendy, Tho Herod, Jos Hill, Jn Howard, J Hunt, Ben Incheley, Iphigenia, J Jackson, Tho Jackson, Jacobus, Juvenis, H M, Old Man &c. Marabell, Maria, Hen Mellanby, Tom My-tery, I Nayler, Jn Needham, Tho Nield, R S Peers, Nancy R—n, Miss E-mily Rivers, Roger, Senex, Miss Betty Smales, Fra Smith, T Smith, Geo Ste-venson, Wm Swift, Sylvia, Wm Turner, Bore Twaddle. Jn Unwin, Miss MW, Miss Sarah Walker, J Walton, and Mrs Abigail Winterbottom.*

The answer by Miss Betty Smales was particularly curious; being written in blank verse, in 30 lines, and the last word of every line being taken from the beginning, in the order of succession, and ranged in lines, they form the two following couplets of rhymes; which we insert as an ingenious specimen of composition by the fair sex: though we would not recommend such arduous attempts in future; as the dif-ficulty of introducing the names of the enigmas into common versifica-tion, is already sufficiently great, to expect at the same time good verses. The four lines are these:

In vain this sweet romantic scene invites;  
 The swain is false in whom my soul delights:  
 I'll fly to some sequestered silent grove,  
 And die a victim to neglected love.

## ANSWERS to the REBUSES, CHARADES and QUERIES.

REBUSES. 1 Stonehenge, 2 Eland, 3 Friend, 4 Manchester, 5 Betty Brown.

CHARADES. 1 Turnstile, 2 Brimstone, 3 Ear-rings.

*The Rebuses answered by Miss Smales. — To Mr. John Cope.*

Let <i>Eland</i> with fair <i>Betty Brown</i>	Till echo from the tuneful bowers,
Accept <i>Ecclesiæ's</i> treat,	Repeat the joyful song.
While I with you, dear youth un-	You'll find me sprightly, kind, and
At <i>Manchester</i> do meet. [known,	free;
Thro' fields and woodlands deck'd,	And rolling years shall prove,
with flow'rs,	Fixt as <i>Stonebenge</i> my faith shall be,
We'll carrol blithe along;	My friendship and my love.

*The same answered by Sylvia.*

My friend at <i>Manchester</i> I'd meet,	Dear <i>Betty Brown</i> , and <i>Eland</i> too,
Nor more wou'd wish to range,	Our party shall attend;
Unless he lead my devious feet	My heart shall love the virtuous few,
To <i>Matlock</i> or <i>Stonebenge</i> .	But center in my friend.

*The same answered by Maria.*

Tho' <i>Manchester</i> for trade be fam'd,	Yon famous ruin call'd <i>Stonebenge</i> ,
<i>Eland</i> in wit excell,	Its ancient turrets bend;
And <i>Betty Brown</i> of <i>Liverpool</i>	These all by <i>Emma</i> are not priz'd
Be deem'd a nonpareil.	So much as one true friend.

*The same by Mr. J. Hunt.*

<i>Calliope</i> ! dear maid, attend me,	<i>Eland</i> writes, and thus invites us,
Come <i>Euterpe</i> , aid my lays;	So to feast and please the mind.
Dear <i>Melpomene</i> befriend me,	<i>Stonebenge</i> can't itself discover
While I sing <i>Diaria's</i> praise.	Curious things in greater store;
Questions ev'ry year delight us;	<i>Betty Brown's</i> most ardent lover
Some from <i>Manchester</i> we find;	Must this exercise adore.

*The Charades answered by Mr. Francis Smith, of Golden Lane.*

The three charades so pleasant seem,	I find the ear-rings in a trice.
I'm quite delighted with the theme.	But <i>brimstone</i> , Sir, is mighty dark,
The turn- <i>stile</i> lets us in so nice,	Unless illumed by a spark.

*The same by Mr. James Palmer, of Liverpool.*

Lady Di in her charades gives some curious catches;  
For gold-rings and *brimstone* are both us'd in matches.

Various other curious answers to the rebuses and charades were given by our ingenious correspondents T B, W P B, Jn Bayley, Wm Bearcroft, Jn Bransby, Di Browne, Jn Burrow, Jn Campbell, Tho Cock, Jos Cowing, W W Crowle, Jn Cullyer, R Dening, J B Digby, G Dixon, R Dowden, *Ecclesiæ*, T Eland, W Evans, P Filder, Jn Fildes, Gradus, R Hendy, J Hornby, Jn Howard, J Jackson, Tho Jackson, Jacobus, Hen Mellanby, Tom Mystery, Jn Needham, Tho Nield, F Price, Philorebus, Nancy R—n, Emily Rivers, Roger, A Rowe, Pb Rusber, Is Saul, G Simpkin, T Smith, Miss Snell, Geo Stevenson, Wm Swift, J Townsend, Tho Truswell, Wm Turner, Jn Unwin, Miss M W, Cba Walker, Sarab Walker, J Walton, Jn Watkins, and Mrs Abi Winterbottom.

QUERY I. *answered by Mr. J. Hunt, of Stony Stratford.*

It is plain the sun must be in the horizon for us to discern half the bow, which is the most that can ever be seen, standing on a plain; for then the center of the bow is in the superficies of the earth. But the higher the sun is above the horizon, the lower the center of the bow sinks beneath the earth's surface; and when his height is  $54^{\circ} 22'$ , the bow will be wholly depressed below the horizon, and no part of it will be visible. In the winter half year the bow may be seen all the day; for then the meridian or greatest height of the sun, never exceeds  $38^{\circ} 30'$ .

QUERY II. *answered by Mr. J. Jackson, of Hutton-Rudby School.*

The small particles of rarefied water or steam pervade the first paper, by escaping warm through its pores, without being able to damp it; because the under paper is screened from the cold air by that above it. But in passing through the pores of the upper paper, the steam meets with the cold external air, which condenses it to water again on the upper paper, and wets it. — For if any thing as warm as steam be held over it, it will not soon become wet. But if any thing colder be held over the steam, it will almost instantly have drops of water hanging on it.

QUERY III. *answered by Mr. William Bearcroft.*

The two characters in the query are both, though perhaps not equally disagreeable. A man may be a spendthrift, and yet have some good and endearing qualities, sufficient to plead in his behalf to the person who can look with a forgiving eye upon his failings; and there is great reason to hope that time may, as it commonly does, produce a reformation in him. But the mind and affections of a miser are so completely fixed upon his pelf, that the most amiable and virtuous woman would be disregarded by him, and as a reformation in a miser would be almost a miracle, we may reasonably suppose him the more disagreeable husband.

QUERY IV. *answered by Mr. James Williams, of Colyton School.*

The salt, entering with the water into the thread, is melted by the flame (fusibility being a well-known property of salt) and the particles of it are united to each other, so as to form a continued substance, capable of sustaining a small weight.

A variety of answers to the queries were given by our ingenious correspondents T B, Eliza Bausor, J Bayley, Wm Bearcroft, Jn Burrow, Jn Campbell, Jn Cavill, Jn Cope, G Dixon, T Eland, Jn Harvey, Rob Hendy, J Hornby, J Hunt, J Jackson, Jacobus, Jn Lowry, L Knapp, H Mellanby, Philorebus, A Rowe, Jn Sampson, I Saul, Tho Truswell, Sarah Walker, J Walton, Rd Waugh, Ja Williams, Abigail Winterbottom, Jn Winterbottom, and Tho Woolston.

## NEW ENIGMAS.

## I ENIGMA 685, by Miss Sarah Walker, of Runswick.

<p>I'm not confin'd to pomp or state ; Men of all ranks my favours share ; I'm born to shorten sorrow's date And ease the tortur'd brow of care. Oft to assist the youth in fight, I smiling with him take the field ; But if by fear I'm put to flight, The most courageous heart will yield. When, rack'd with doubt, the virgin fair Sits doating on her fickle love,</p>	<p>At intervals suspend despair, And say he's faithful as the dove. But I'm a flatterer found at best, And often when sad woes are near, Like a false friend I fly the test ; But pleasure give to some elsewhere. Yet never rank me as a foe, Tho' I perhaps may you betray ; And fool'd the witty long ago. — Enough. 'Tis needless more to say.</p>
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## II ENIGMA 686, by Mr. J. Bunsford, junior.

<p>Ye lovely fair, whose ready wit The darkest mystery can hit, Attend, and thro' a thin disguise Discover whom you often prize. For you with gratitude I glow, And fervently my service shew. The idle rich I oft attend ; The sick and needy too befriend. I cheer the traveller at the inn,</p>	<p>When nightly storms have wet his skin. My charms the coldest can engage, And warm the blood of frozen age. When man too much my anger tries, With fury glow my countless eyes : But when my temper's seen to calm, Gently I'm taken by the arm ; To some still place convey'd, and share A peaceful rest from work and care."</p>
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## III ENIGMA 687, by Mr. John Bayley, of Middleton.

<p>Ladies to crown my pow'r and worth, I gave my help at woman's birth. You'll say I'm old. I am indeed ; The world itself doth scarce exceed. With ease all nations I subdue : They to my charms submissive bow. All things on earth my power obey, And at my nod do prostrate lay. And yet it seems a prodigy,</p>	<p>That mortals should have love to me, When I but one poor brother have, Who's hated by them as the grave. Ye fair whose cheeks I daily warm, Each feature gild, illumine each charm ; If I should farther now explain, With too much ease you'd tell my name.</p>
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## IV ENIGMA 688, by Mr. Wm. Francis, of Dippenhall.

When Prussia's king pursues the vanquish'd foe,  
When England's monarch drives the panting doe,  
Without me ill at ease themselves they'd find,  
Nor are well pleas'd unless I'm close behind.  
My favours not to kings alone I deal ;  
Troopers and huntsmen all my service feel.  
When the bold highwayman bears off his prize,  
Firmly on me for safety he relies :



Yet spread the alarm, send out the hue-and-cry,  
And with the first in the pursuit am I.  
Take one hint more, then guess me if you can,  
Something I am between a brute and man.

V ENIGMA 689, *by Monimia.*

1. Ye gentle sympathetic nymphs attend  
With pitying ear to this my plaintive tale;  
You oft acknowledge me to be your friend,  
And often woo me in the lonely vale.
2. 'Tis said I was a maid, and in my face  
Shone every charm that could adorn the fair,  
When man most cruel brought me to disgrace;  
And I was doom'd another form to wear.
3. Thus chang'd, I fly afar from crowded courts;  
The city's busy scenes I likewise fly:  
From festive pleasure's ever gay resorts:  
Shunning with greatest care the public eye.
4. In some lone grove beside a limpid stream,  
What time night's pensive queen her soft light throws,  
I frequently repeat my sorrowing theme,  
While sighing zephyrs bear around my woes.

VI ENIGMA 690, *by Mr. J. Hunt, of Stony Stratford.*

Before this globe was into being hurl'd,  
Or God produc'd an instantaneous world,  
I silent reign'd; compos'd each peopled star,  
And form'd the planets, glorious as they are.  
More high than they my being I sustain;  
More deep than hell; than Satan too, more vain.  
The miser, careful of his hoarded pelf,  
Who grudges others, and who starves himself,  
Who labours day and night his pence to save,  
Can carry only me unto the grave.  
And ladies, single or in wedlock join'd,  
May you have me to discompose your mind.

VII ENIGMA 691, *by Mr. Tho. Jackson, of Belper.*

Lo, here comes, with wide extended mouth,  
And deafning clang, one known from far. —  
Does death demand your tears? He mourns your cause,  
And doleful sounds are heard. —  
If fair Corinna's bless'd the worthy youth  
Who long has sought her hand; and all their friends  
Salute, with joy, the happy pair; lo, he exerts  
His soul-exhilarating voice,  
And sings in chorus with the joyous throng. —  
When warring nations strew th' ensanguin'd field  
With mangled limbs; 'tis he proclaims the news. —

When sober twilight spreads her shadowy wings,  
And chafes day light from this sea-girt land;  
He in loud notes proclaims the parting day,  
And hails the solemn stillness of the night.

VIII ENIGMA 692, *by Mr. Tho. Truswell, of Nuneaton.*

Pray start not ye fair at my daring ambition,  
Since only I act by a daily commission. —  
Like Whitfield or Wesley, above the low crowd,  
With my audience around I keep bawling aloud.  
On subjects quite different from them I can preach,  
But often like them just repentance can teach.  
Like biting attorney I tell my conditions;  
Saluting my friends with my loud repetitions.  
If your purses, dear ladies, are loaded with chink,  
I can guess what you mean by a nod or a wink.  
Sometimes I'm a tinker, a dealer in brass;  
And bring many comical wonders to pass:  
Or cooper; in hoops I have been a partaker:  
And sometimes a joiner, or cabinet maker.  
The cause of my making such public appearance,  
Is thro' some neglect or some stern perseverance;  
Or else thro' the death of some friend or relation;  
Or gone quite away to some far situation.  
From hence tell the world what I've lately been doing,  
Adieu my dear ladies: agoing, agoing.

IX ENIGMA 693, *by Mr. Rob. Richardson, of Frosterly.*

In fertile fields where nature's genial pow'r  
Bids soft Favonius shed the soft'ring show'r,  
Near where yon chrystal streams meand'ring glide,  
My parent smil'd "in vegetative pride."  
But when fair science wak'd the slumb'ring soul,  
My use was known, ye fair, from pole to pole;  
While, from my parent's death (sad scenes of woes!)  
With plastic touch, a new creation rose. —  
By yonder cavern, dark as awful night,  
Suppose a snow-clad plain now greets your sight;  
See a magician rule with pow'rful sway,  
And your fair suppliant all his laws obey.  
But shou'd kind fate preserve me from his pow'r,  
Still heavier trials wait a future hour:  
Yet, greater honours thence I may derive;  
And, clad in gold, to latest times survive:  
Paint truth and virtue in their fairest light,  
And lead the erring steps of youth aright;  
Bid wisdom dawn upon the op'ning heart,  
And heav'n's own mandates unrestrain'd impart.

X ENIGMA 694, *by Eugenio.*

Ladies, a well known servant of the fair  
 Now humbly begs permission to appear.  
 And sure you'll not deny a friend a place,  
 Who gives you ease in almost every case.  
 To bird or beast I partly owe my birth,  
 And partly am indebted to the earth. —  
 When fortune proves severe, or friends unkind,  
 To me your sorrows bear — in me you'll find  
 A faithful friend — for ne'er was I accus'd  
 Of broken faith, or confidence abus'd.  
 If from your eye a trickling tear should stray,  
 I often wipe that trickling tear away:  
 And tho' I can't your warmest wishes crown,  
 Your woes in sweet oblivion oft I drown.  
 When health, and strength, and all enjoyments fail;  
 When birth and wealth, and titles nought avail,  
 I ease afford — support the hoary head of age,  
 His sorrows lessen, and his pains assuage.  
 Ev'n when that awful period shall arrive,  
 When anxious friends no kind relief can give,  
 I still am near, assist the obstructed breath,  
 And make more easy ev'n the bed of death.

XI ENIGMA 695, *by Miss Betty Smales.*

1. Ye nymphs and swains your jocund songs advance;  
 Prepare your garlands, cull the newborn flowers;  
 Breathe your soft flutes, lead on the sprightly dance,  
 Let laughing pleasure wing the downy hours. —
2. For lo, I come, parent of fond delight,  
 With lasting fame, and living honours crown'd;  
 Drest in a flowing robe of green and white,  
 With purple, blue, and gold embroider'd round.
3. I come attended by a virgin queen,  
 The god of love and all his smiling band;  
 The rural train are happy in my reign,  
 For freedom, mirth, and love walk hand in hand.
4. But ah, ye fair, a dreary change is nigh;  
 Fly hence, let watchful prudence guard the way;  
 To hail me, welcome music fill'd the sky,  
 But short and transient is my measur'd stay.
5. The sun is sunk beneath the western clouds,  
 And ting'd their fleecy tow'ring tops with gold;  
 A solemn gloom the face of nature shrouds,  
 The drowsy flocks are gathering round the folds.
6. Ye flow'ry fields, ye Albion's plains, adieu;  
 I must depart, by nature's soft command;  
 And instantly my glorious reign renew,  
 To claim my honours in a distant land.

## XII (or PRIZE) ENIGMA 696, by R. B. Sphynx.

To dark idolatry I owe my name,  
 Yet kindred with the pure religion claim.  
 Belov'd of many, honour'd but by few  
 Am I. My elder brother is a Jew.  
 So much resemblance in our looks you see,  
 That many give my brother's name to me.  
 Yet he is superannuate and grey,  
 And slighted as the boast of yesterday:  
 While I the hope of this politer age,  
 The just attention of all ranks engage.  
 Still we like Castor and like Pollux shine;  
 For if I rise, my brother must decline.  
 The while an exil'd few his steps attend,  
 Bow in his fane, and at his presence bend.  
 On me ten thousand times ten thousands wait;  
 A thousand well clad thousands swell my state:  
 Who hope in me their sorrows to beguile,  
 Mourn in my frown, and triumph in my smile.  
 I respite malefactors from their doom;  
 And give the debtor liberty to roam.  
 Me the wild stripling loves; yet, void of grace,  
 Full oft his bat or ball deforms my face.  
 One hint, and then adieu. I often stand,  
 Array'd in red, the captain of a band;  
 Who, ever changing, yet the same appear,  
 My small, yet faithful cohort thro' the year.  
 Blow tempest's rude, or beat the pealing rain,  
 They never stray one moment from my train:  
 United we e'en time himself defy,  
 For while his scythe shall smite, we cannot die.

## NEW REBUSES, CHARADES, and QUERIES.

## I REBUS, by Mr. I. Townsend.

Two fives rightly join'd,  
 And two circles behind,  
 With these a right angle connect.  
 Th' initial bring  
 Of Israel's first king  
 And place them in order direct.

Twice ten hundred weight  
 A name will complete,  
 Of a genius, in order apply'd,  
 Whose verses appear  
 In Diary each year,  
 And with whom I at present reside.

## II REBUS, by Mr. William Bearcroft.

To two-fifths of the first king of Italy, join  
 One third of what Jove drinks instead of red wine. —  
 Next half of an instrument hymen will own,  
 And four-fifths of a map, by the seamen well known;

Then the number five-hundred be pleased to take;  
 These, with half a small poem, will easily make  
 The name of a goddess in human disguise,  
 Who wounds, and can cure, with the dart of her eyes.

### III. REBUS, by Mr. J. Walton, of Allen-town.

A Roman pontif if you'd please to take;  
 And she who pin'd for vain Narcissus' sake;  
 A Grecian chief by valiant Paris slain;  
 And he who founded Rome on Tiber's plain;  
 A king of old for wisdom justly fam'd;  
 And he whose harp the greatest merit claim'd,  
 Who stay'd the streams, and mov'd the list'ning woods;  
 And he whose trident rules the azure floods.  
 Th' initials join, they'll name a blooming fair,  
 Renown'd for virtue, and her jetty hair.

### IV REBUS, by Mr. W. Evans, of Walsingham.

What to be griping, usurers still make their care;  
 Three-fourths of a bard, and the whole of an heir,  
 Connected together, will shew you a name,  
 Has stood 'mong the first in your pages of fame.

### I CHARADE 4, by Mr. Benjamin West, of Weedon-Beck.

My *first*, with laurels deck'd, in days of yore,  
 To Rome in triumph her Augustus bore;  
 What Sylvia's in when clowns appear too bold,  
 Or coxcombs teize, my *second* will unfold;  
 Both *parts* will shew when they in contact meet,  
 What's much admir'd, yet trampled under feet.

### II. CHARADE 5, by Mr. Rob. Richardson.

Prolific *first*! thy genial aid to share,  
 The swain pours fourth to heav'n his ardent pray'r;  
 Unerring *next*! as Cheviot's plains can tell,  
 By thee, in one short day, what numbers fell!  
 Indulgent *whole*! blest covenant of heav'n!  
 By thee, new life to a lost world was giv'n.

### III CHARADE 6, by Ecclesiæ.

To *begin*, think where Damon first saw his fond bride;  
 My *second's* a rule much esteem'd by the fair;  
 The *whole* is a place where no discords reside;  
 Tho' sixty once married and single are there.

## IV CHARADE 7, by Mr. Wm. Jones, of Heyford.

Dobbin, careless how he goes,  
Throws my *first* in miry sloughs,  
If my *second* meet his toes;

Wonders great my *whole* produces;  
Jolly tars, who go on cruises,  
Prize its virtues, know its uses.

## I QUERY, by Mr. Isaac Saul.

I should be glad to know what is the composition of the Indian rubber, or elastic gum, or lead eater; and how and where it is made.

## II QUERY, by Mr. Samuel Oliver.

Pray how may we resolve the following query in Virgil, pastoral 3d, line 161.

“ Say, where the round of heav’n, which all contains,  
“ To three short ells on earth our sight restrains.”

## III QUERY, by Mr. George Beck.

How comes it about,  
That our fires go out,  
When the glories of sol over shine  
us;

Is the nature the same,  
Of his light and our flame,  
Or is there fire *plus* and fire *minus*.

## IV QUERY, by Mr. Henry Lee, of Bingham.

Diarian nymphs, if e’er you hope to share  
The joys connubial, and wish to wear  
The *pledge* of love, its origin declare;  
Say from what motives first the custom sprung,  
And why on the fourth finger always hung?

\* \* \* There will be eight Prizes, to be determined by lot, viz. two of 8 diaries each for the solution of the prize enigma; two of 8 diaries each for the general solution of the enigmas; two of 6 diaries each for the solution of the rebuses, queries, &c. also one of 10 and one of 8 diaries for the solution of the prize question. — All our correspondents letters must be sent before the 1st of May. — And they are requested to make their compositions as short as they can, that they may not be omitted thro’ their too great length. We are sorry that we have been obliged to abridge most of them this year, to include the usual number. — Solutions must be sent with all new compositions.



## ANSWERS to the MATHEMATICAL QUESTIONS.

I QUESTION 848 answered by Mr Mut Fleck, of Gadlis.

ADD the three given equations together, and the square root of the sum will be  $x + y + z = 32$ . Then divide each of the three given equations by this last equation, and we shall obtain respectively  $x = 23 = W$ , and  $y = 5 = E$ , and  $z = 4 = D$ . So that Miss Polly consented to WED.

The same answered by Mr John Birch, Schoolmaster of Moulton.

Divide the former equations by the latter, and we shall have

$$\frac{x}{y} = \frac{23}{5}, \text{ and } \frac{x}{z} = \frac{23}{4}, \text{ and } \frac{x}{y} = \frac{5}{4}.$$

And because the values of  $x, y, z$ , must be whole numbers, within the limits of the alphabet, therefore

$$x = 23, \text{ and } y = 5, \text{ and } z = 4.$$

Consequently to WED was what the fair one granted.

Ingenious solutions were also given by Messrs Amicus, W P B, T Baker, Rd Ball, Mrs Bausor, Jno Bransby, R Bretherick, Jno Burrow, J G C, Jno Campbell, Jno Cansfield, Jno Cavill, Tho Chapman, S Clement, Tho Cock, Wm Cole, Constancy, Sam Craven, Jno Cullyer, Jno Dalton, G Dixon, Rob Dowden, L Evans, Jno Farey, Jno Finney, Wm Gooch, Jno Gould, Tho Hall, Jno Harvey, Jos Hill, Jno Hopps, J Hornby, Jno Howard, J Hunt, J Jackson, Wm Jackson, L Ker, Wm Lambeth, Jno Mole, Tho Nield, Jno Norman, Wm Penn, Philarithmus, Jas Pybus, Geo Roberts, Jno Roheram, Alex Rowe, Jno Sampson, Isaac Saul, Jas Scholesfield, E Sheppard, Tim Simpson, Wm Simpson junr, T Smith, Geo Stevenson, Jno Surtees, Wm Terril, Mat Terry, Jno Thompson, Tho Truswell, Jno Unwin, T M Waller, Wm Walters, J Walton, Rd Waugh, Wm White, A Whitehouse, Tho Willan, Jas Williams, Edw Wilson, Jno Winterbottom, Tho Woolston, and Jas Young.

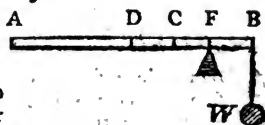
II QUESTION 849 answered by Mr Wm Gooch.

It is evident that if the lever extended but  $\frac{1}{2}$  of a foot on each side of the support, it would rest in equilibrio; but it extends  $8\frac{1}{2}$  feet farther on one side. And as the center of gravity of a body may be taken for the place of the body, the weight of the said part, viz of  $8\frac{1}{2}$  feet, or 102 inches, may be deemed in its center of gravity, which is evidently in the middle of it, or at 5 feet from the fulcrum. But  $6 \times 6 \times 102 \times .0330946 \text{ lb} = 121.52337 \text{ lb}$  is the weight of the said part: and as the weights are reciprocally as their distances from the fulcrum, it will be as  $\frac{1}{2} : 5 :: 121.52337 : 810\frac{7}{8} \text{ lb}$ .

*The same by Mr Tho Woolston, Master of the Boarding-School at Adderbury.*

Let  $AD = DB = 5$ ,  $BF = \frac{1}{4}$ , and  $W =$  the weight sought.

Now the solidity of the lever is 4320 cubic inches, and its weight 21060z or  $175\frac{1}{2}$  lb troy  $= C$ . Then as  $BF : DF$  cr as  $\frac{1}{4} : 4\frac{1}{4} :: C : \frac{1}{3} C = 99\frac{1}{2}$  lb troy, the weight required.



*Ingenious answers were also given by Messrs Amicus, Birch, Bretberick, Burrow, Campbell, Canfield, Cock, Cole, Craven, Cullyer, Cunliffe, Dalton, Dixon, Evans, Farey, Gould, Fleck, Hall, Hill, Hopps, Hornby, Howard, Jackson, Mole, Nield, Norman, Penn, Philarithmus, Rotheram, Rowe, Sampson, Saul, Scholesfield, Sheppard, Tim Simpson, Wm Simpson, Terril, Terry, Truswell, Waugh, Wbisehouse, Mr Winterbottom, Williams, and Young.*

### III QUESTION 850 answered by Amicus.

On AB, one of the given equal distances, take AN equal half the sum of the two unequal ones, and perp. to AN draw NP equal half their difference; join PB, draw  $PO \parallel AB$ , also draw BO to make the angle  $PBO = BPO$ , so is O the center, and  $PO = BO$  the radius of the less circle required.

For, through O draw  $DG \parallel PN$ , cutting AB produced in C; with the radii PO, AC describe the circles EPBF, DAG; set off  $Ce = Cf = CN = BO = PO$ ; then  $Ee$  is evidently  $= Ff$ , and  $De = fG = \frac{1}{2} FG + \frac{1}{2} DE = AN$  half the given sum by construction. And since  $CD = CG = AC$ , and  $OE = OF = CN$ , therof.  $FG - DE = OG - DO = 2OC = 2PN$  the given dif. by construction; and consequently the circles are those required.



*Calcul.* By the question  $AN = 13$ ,  $BN = 2$ ,  $PN = 8$ ; then  $PB^2 = PN^2 + BN^2 = 68$ , and since the angle  $PBO = BPO = PBN$  because of the parallels AB, PO; by sim. triangles as  $2BN = 4 : PB :: PB : PO = \frac{68}{4} = 17$ ; and  $AC = 30$ .

*Geometrical solutions were also given by Messrs Jno Aspland, Wm Cole, Jno Howard, J Hunt, and Philarithmus.*

*The same Algebraically by Mr John Dalton, Teacher of the Mathematics in Kendal.*

Put  $x = CB$ . Then is  $x + 15 = CA = CD = CG$ ,  $x + 10 = CE$ , and  $x - 6 = CF$ . And, by the property of the circle,  $CE \times CF = CB^2$ , that is  $x + 10 \times x - 6 = x^2$ , or  $x^2 + 4x - 60 = x^2$ ; hence  $4x = 60$ , and  $x = 15$ . Therefore  $DG = 2CA$  or  $2CD = 60$ , and  $EF = 2x + 4 = 34$ , the two diameters sought.

*Algebraical solutions were also given by Messrs Birch, Bransby, Bretterick, Burrow, Campbell, Canfield, Carwill, Clement, Cock, Craven, Culyer, Cunliffe, Dowden, Evans, Farey, Finney, Fleck, Gooch, Gould, Hall, Hill, Hopps, Hornby, Jackson, Ker, Mel, Nield, Norman, Pybus, Roberts, Rotheram, Rowe, Sampson, Stevenson, Saul, Scholefield, Tim Simpson, Wm Simpson, Surtees, Thompson, Terril, Terry, Truswell, Walton, Waugh, White, Whitehouse, Willan, Wilson, Winterbottom, Williams, Woolston, and Young.*

#### IV QUESTION 851 answered by John Rotheram, M.D.

The two sides  $38^{\circ} 29'$  and  $38^{\circ} 14' 22''$ , and included angle  $1^{\circ} 10'$  of a spherical triangle being given, namely the complements of the two latitudes, and the difference of longitude, the third side or direct distance is found to be  $45' 49''$ ; which, the earth's radius being 3979, is  $53.0302$  miles. And as London appeared in the horizon, the height of Mr Sadler  $\div$  earth's radius is the hypotenuse of a right-angled plane triangle, one of whose sides is 3979, and the adjacent angle  $45' 49''$ ; then, by sim. triangles, as  $1 : \text{nat. sec. } 45' 49'' - 1 :: 3979 : 353$  miles or  $621$  yards, which is the height of the balloon.

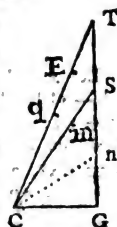
*Mr Tho Willan, of Gorton, after giving the solution by the common tables of trigonometry, justly observes that, The answer will, in some respect, be different (and I apprehend more accurate) if the method of calculation be used which is recommended in page 168 of Dr Hutton's Introduction to his Mathematical Tables, lately published; by which the required side of the spherical triangle is  $45' 53''$  nearly, and the distance of the two places  $53.107$  miles; though in Mr Sadler's height it makes but little alteration.*

*Nearly in the same manner was the answer given by Messrs Amicus, Birch, Bransby, Burrow, Campbell, Canfield, Clement, Cock, Cole, Culyer, Dalton, Dowden, Evans, Farey, Fleck, Gooch, Gould, Hall, Hopps, Hornby, Howard, J Jackson, Jno Jackson, Mole, Rowe, Sampson, Scholefield, Stevenson, Simpson, Surtees, Terril, Truswell, Waugh, White, Whitehouse, Williams, Woolston, and Young.*

#### V QUESTION 852 answered by Amicus.

Make  $CG$  = the distance of the given point from the building; perp. to which draw  $TG$ , on which take  $Gn$  =  $\frac{6}{5}$  of the given dif. of the lengths of the ladders;  $Cn$  being joined, apply  $CS = Cn + \frac{2}{3} Gn$ , and  $CT = Cn + \frac{3}{2} Gn$ , so shall  $TG$  be the height required.

For take  $Cm = Cq = Cn$ , and  $CE = CS$ ; then by constr.  $Tq = \frac{3}{2} Gn$ , and  $Sm = Eq = \frac{2}{3} Gn$ ; conseq.  $Tq \cdot Eq = Tq \cdot Sm = Gn^2$ , and  $TE = \frac{3}{2} Gn - \frac{2}{3} Gn = \frac{5}{6} Gn$  = the given dif. of the lengths of the ladders by constr. Moreover (by Simp. Geom. 2, 9)  $TG^2 - SG^2 = CT^2 -$



$CS^2 = \text{rect. under TE and TC} + CE$ ; in like manner  $SG^2 - Gn^2 = \text{rect. under Sm and CS} + Cm$ ; and  $Gn^2 = Sm \cdot Tq$ , so shall  $SG^2 = \text{rect. under Sm and CS} + Cq + Tq$ , or under Sm and  $TC + CE$ ; conf.  $TG^2 - SG^2 : SG^2 :: TE : Sm :: 5 : 4$ , and by comp.  $TG^2 : SG^2 :: 9 : 4$ , or  $TG : SG :: 3 : 2$ . *Q. E. D.*

*Generally.* If  $TG : GS :: m : n$ , then  $Gn : TE :: mn : m^2 - n^2$ , and  $Sm : Tq :: n^2 : m^2$ , and the constr. as before,

*Calcul.*  $Cn = \sqrt{CG^2 + Gn^2} = 24.644677488$ ,  $TC = Cn + Tq = 46.244677488$ , and  $TG = 41.6961504$  required.

*Geometrical solutions were also given by Mr. Ste Ogle, Mr Wm Simpson junr, Mr Wm White, and Warkworthensis.*

*Algebraical Solution by Mr John Cullyer, Assistant at Mr M<sup>c</sup> Kain's Boarding School, Bungay.*

Put  $x$  for the length of the shorter ladder. Then is  $x + 12$  the longer, and as  $2 : 3 :: \sqrt{x^2 - 400} : \frac{3}{2}\sqrt{x^2 - 400}$  the height of the building. Conseq.  $\frac{9}{4}x^2 - 400 + 400 = x + 12^2 = x^2 + 24x + 144$ ; hence  $5x^2 - 96x = 2576$ , and  $x = 34.24$ ; and the height of the building  $41.696$  feet.

*Algebraic solutions were also given by Messrs Ball, Birch, Bransby, Bretherick, Burrows, Campbell, Cansfield, Cavil, Clement, Cock, Cole, Constancy, Craven, Cunliffe, Dalton, Dimpleby, Dixon, Evans, Farcy, Finney, Fleck, Gooch, Gould, Hall, Hill, Hopps, Hornby, Howard, Jackson, Lambeth, Mole, Nield, Norman, Penn, Philarithmus, Roberts, Rowe, Sampson, Saul, Scholefield, Sheppard, Stevenson, Tim Simpson, Smith, Surtees, Thompson, Terril, Terry, Truswell, Waller, Walton, Waugh, Whitehouse, Willan, Wilson, Williams, Winterbottom, Woolson, and Young.*

**VI QUESTION 853 answered by Mr James Young, of Pruddoe.**

Let  $x$  and  $y$  be the two numbers. Then must  $x - y$ ,  $x^2 - y^2$ ,  $x^3 - y^3$  be all three squares. Or divide the second by the first, so shall  $x + y$  be a square also. Take the first  $x - y = x^2$ ; then  $x = x^2 + y$ , and the second square or  $x + y = x^2 + 2y = \text{suppose } 4x^2$ ; hence  $y = \frac{3}{2}x^2$ , and  $x = \frac{5}{2}x^2$ . Then, by the third condition,  $x^3 - y^3$  or  $\frac{9}{8}x^6 = \frac{49}{4}x^6$  must be a square, which it evidently is. Hence then the two numbers are  $\frac{3}{2}x^2$  and  $\frac{5}{2}x^2$ , where  $x$  is any number whatever. *And*

when  $x$  is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, &c.  
 then  $x = 2\frac{1}{2}, 10, 22\frac{1}{2}, 40, 62\frac{1}{2}, 90, 122\frac{1}{2}, 160, 202\frac{1}{2}, 250, \&c.$   
 and  $y = 1\frac{1}{2}, 6, 13\frac{1}{2}, 24, 37\frac{1}{2}, 54, 73\frac{1}{2}, 96, 121\frac{1}{2}, 150, \&c.$

*The same by Mr Wm Cole, of Colchester.*

Let  $x$  and  $y$  represent the two numbers; and assume  $x - y = a^2$ , and  $x + y = m^2 a^2$ ; so shall  $x^2 - y^2$  be  $= m^2 a^4$ , which is always a square.

Now  $x = \frac{m^2 a^2 + a^2}{2}$ , and  $y = \frac{m^2 a^2 - a^2}{2}$ , theref.  $x^3 - y^3 = \frac{3m^4 + 1}{4} a^6$

must be a square, and consequently  $3m^4 + 1$  a square: this it is evident will happen when  $m$  is  $= 2$ . Therefore the dif. of the two numbers may be taken equal to any square number at pleasure, and their sum equal to 4 times that number.

Suppose  $x - y = 4$ ; then  $x + y = 16$ ,  $x = 10$ , and  $y = 6$ . Hence  $x - y = 4$ ,  $x^2 - y^2 = 64$ , and  $x^3 - y^3 = 784$  are all square numbers; and these seem to be the least whole numbers the question will admit of.

*It was also ingeniously resolved by Messrs Amicus, Aspland, Ball, Burrows, Cavill, Clement, Culyer, Dalton, Diophantoides, Dowden, Evans, Gooch, Hall, Harvey, Howard, Ker, Mole, Philarithmus, Rowe, Sampson, Saul, Scholesfield, Terril, Waugh, Walton, White, Wilson, and Williams.*

## VII QUESTION 854 answered by Mr Ja Wilson, of Colyton.

The square on the side of an equilateral triangle, is equal to three times the square on the radius of the circumscribed circle; therefore the squares on all the three sides, are equal to 9 times the square on the radius. — By the theorem referred to in Amicus's solution to quest. 840, twice the sum of the squares on the perpendiculars to the sides of the figure, is equal to the number of sides  $\times$  3 times the square on radius; that is, 18 times sq. radius  $=$  3 times the number of sides  $\times$  sq. radius; therefore 6  $=$  the number of sides, and the figure is a hexagon.

*The same by Mr Rob Dowden, of Woollavington.*

Call the radius of the inscribed circle  $r$ , the side of the inscribed equilateral triangle  $s$ , and the number of sides of the polygon  $n$ . Then, by Eucl. I. 47,  $\sqrt{s^2 - \frac{1}{4}s^2} = \sqrt{\frac{3}{4}s^2}$  the perpendicular; and, by the nature of the circle, as  $\sqrt{\frac{1}{4}s^2} : s :: s : \sqrt{\frac{4}{3}s^2} = 2r$ ; hence  $s^2 = 3r^2$ ,

and  $3s^2 = 9r^2 =$  the sum of the squares; then by Stewart's theorem  $9r^2 = \frac{3}{2}nr^2$ ; conseq.  $3n = 18$ , and  $n = 6$ ; therof. the figure of the fortification is a hexagon.

Other solutions were given by Messrs Amicus, Burrows, Cavill, Cole, Cullyer, Cunliffe, Dalton, Farey, Licut Glenie and Lieut Haldane, of the Royal Engineers, Hoquard, Wm Jackson, Philarithmus, Sampson, Sanderson, Saul, Scholefield, and White.

### VIII QUESTION 855 answered by Mr A Whitehouse, of Wolverhampton.

Put  $r = 21$  million feet the earth's radius.  $a = 528000$  million feet the sun's distance,  $x$  any variable distance from the center of the earth, and  $s = 32\frac{1}{8}$  feet; also  $v$  the velocity, and  $t$  the time. Then  $x^2 : r^2 :: s : sr^2 x^{-2}$  the force at  $x$  distance; therefore  $v dv = -sr^2 x^{-2} dx$ ; and the fluent corrected (by taking  $x = a$  when  $v = 0$ ) is  $v^2 = 2sr^2 \times \frac{1}{x} - \frac{1}{a}$ , and  $v = r \sqrt{\frac{2s}{x} - \frac{2s}{a}} = (\text{when } x = r) r \sqrt{\frac{2s}{r} - \frac{2s}{a}} = 36755$  feet or  $6.961$  miles, the velocity at the earth's surface.

$$\text{Again } t = -\frac{dx}{v} = \frac{-dx}{r \sqrt{\frac{2s}{x} - \frac{2s}{a}}} = -\frac{1}{r} \sqrt{\frac{a}{2s}} \times \frac{x^{\frac{1}{2}} dx}{\sqrt{a-x}},$$

and the correct time  $\left\{ \sqrt{\frac{aa-ar}{2rs}} + \frac{a}{2r} \sqrt{\frac{a}{2s}} \right\} \times \text{arch} \left\{ \frac{r}{a} \right\} =$   
when  $x = r$  is  $t = \left\{ \sqrt{\frac{aa-ar}{2rs}} + \frac{a}{2r} \sqrt{\frac{a}{2s}} \right\} \times \text{to cosine} \left\{ \sqrt{\frac{r}{a}} \right\} =$   
 $113 \text{ yrs } 227 \text{ ds } 22 \text{ hrs } 14\frac{1}{2} \text{ minutes, the whole time of descent.}$

True and perfect answers were also given by Messrs Amicus, Cullyer, Dodden, Farey, Rotberam, Terril, and Waugh. Various other answers were attempted, but they were not right.

### IX QUESTION 856 answered by Mr Isaac Dalby.

Let the primitive represent the meridian, HO the horizon, Z the zenith; describe the azimuth circle or ellipse SZN at the distance of  $42^\circ 42' 42''$  from the prime vertical ZN, and draw AA the parallel of altitude; then the point S where it cuts ZSN is the sun's place; through C the center draw AR, and in the same manner as the azimuth circles are described let the ellipse RGA be described to make the  $\angle GRN = 28^\circ 2' 15''$ , draw GW || AA, and draw the diameter WP, on which as





a transverse, and through the point S describe the hour circle or ellipse PSW; then ZP is the co-latitude, SP the co-declination, and the  $\angle ZPS$  the hour angle from noon. For AZ being the measure of ZS, and  $PZ = WN$  that of NG, and the  $\angle GNR = \angle SZP$ , therefore the  $\triangle SZP = \triangle GNR$ , conseq. the  $\angle ZSP$  (the angle made by the hour and azimuth circles)  $= \angle NRG =$  the given angle by construction.

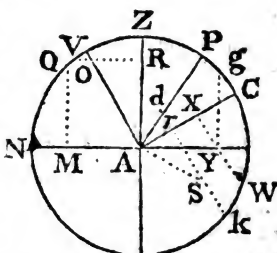
In the triangle SZP there is given the  $\angle SZP = 132^\circ 42' 42''$  the azimuth from the north, the  $\angle ZSP = 28^\circ 2' 15''$ , and the included side  $= 40^\circ 30'$  the co-altitude; whence  $ZP = 36^\circ 56'$  the co-latitude,  $SP = 69^\circ 56'$  the co-declination, and the  $\angle ZPS = 30^\circ 32'$ , answering to 2 h 2 m 4 s, the time from noon.

*Remark.* If the proposer of quest 7 in Diary for 1785, meant that the given angle was that made by two great circles on the globe and their orthographic representation required, then, by supposing SZN the given great circle, and S the given point, the construction will be the same as above. For in my answer in last year's Diary, the great circles or ellipses are inclined in the given angle *when projected*.

### *The same by Amicus.*

Let Z be the zenith in the given meridian whose center is A, and AN the horizon. Take NV = the given altitude, ZQ = the given azimuth; draw MQ  $\parallel$  AZ, and VR to NA; divide VR in O in the same ratio as NA is divided in M. Then, by the nature of the orthographic projection, O is the place of the sun when he has the given altitude and azimuth. We have therefore only to find a point P in the primitive, through which if a great circle be drawn passing through O, and making there an angle with that passing through Z, O, M equal to the given angle, it shall be the hour circle at the time, and P the north pole. Set off a quadrant along the primitive from Q to g; draw gY  $\parallel$  QM cutting the horizon in Y, which therefore will be the pole of the great circle ZOM; draw XYW  $\parallel$  OA cutting AC (perp to OA) in X, and set off Wk = the measure of the given angle which is to be made at O; draw kr  $\parallel$  WX, and divide kr in S as WX is divided in Y; join AS, and draw AP  $\perp$  AS; then is P the north pole required.

For, per projection, C, Y, S are in the great circle whose pole is O, and S is the pole of a great circle passing through P and O, and the arc SY = Wk is the distance of the poles of the great circles PO and ZOM, and is therefore the measure of the angle made by them at O, which consequently by projection is that given.



*Computation.* Since Qg is a quadrant, theref. Zg = NQ, and AY = MQ (the cofine of the azimuth, the  $\angle YAX = RAO$ , and as AO : AY :: AR : AX :: OR : XY; whence XW, the arc CW, and Ck become known, and thence also Kr, Ar, rS Sk, AS,  $\angle rAS = PAO$ , and conf. P'AY =  $53^{\circ} 4'$  the latitude, Ad =  $20^{\circ} 4'$  the declination, and AS = 2 h 2 m the time from noon required.

*Ingenious solutions were also given by Messrs Dalton, Dowden, Ewars, Hornly, Howard, Sampson, Sanderfen, Scholefield, Simpson, Terril, Turner, White, and Young.*

### X QUESTION 857 answered by Amicus.

By the question, copper is 7500 times the density of air at the surface; and if this latter = 1, and  $m = 5280$  the feet in a mile, then at  $x$  feet above the surface of the earth, supposing the force of gravity to be uniform, the density  $\left\{ \frac{1}{4} - \frac{x}{7m} \right\}$  and, the diameter and weight of the globe being given, we have as the weight of the globe; that of an equal one of air at the surface :: 475 : 1000 nearly, hence  $\left\{ \frac{1}{4} - \frac{x}{7} \right\}$  if  $x$  be taken in miles, from which we obtain  $x = \frac{475}{1000} = \frac{1}{2} \frac{7}{7}$  miles. 1.759, the height at which the globe would rest in equilibrio. And if  $n =$  the weight of a globe of air at the surface  $100 \frac{1}{8} \frac{1}{6}$  feet diam. =  $1.2 \times 5236 \times 100 \frac{1}{8} \frac{1}{6}$  ounces, then .525 n oz avoidr. is the weight necessary to keep the globe at rest at the surface.

But though 3.759 miles is the height at which the globe, after oscillating up and down, would at length rest; yet to find the height to which it would at first rise, other principles are necessary. But we are sorry our limits will not admit the elaborate solution given by Amicus of this curious problem.

*The same by Mr Rd Waugh, of Lanchester, Durham.*

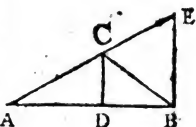
Put  $b = 1200.02$  inches the external diameter of the balloon,  $a = .02$ ,  $n = .5236$ ,  $c = .0000435$  b the weight of a cubic inch of common air,  $d = .32656$  ditto of copper. Then  $cnb = 39360$  lb = the weight of a mass of air of the size of the balloon, and  $dn \times b^3 - \frac{b-a^3}{10} = 14773$  lb the weight of the shell of copper, and  $\frac{1}{10} cn \times b - a^3 = 3936$  lb is the weight of the included gas; theref. 18709 is the whole weight of the balloon, which taken from 39360 leaves 20651 the power of the balloon, or the weight to balance it.

Again, the balloon will ascend and rest at such height in the air, where it will be of equal weight with the same bulk of it, and theref. where its density is to the density of the surface, as 18709 to 39360, or as 1 to 2.104. Hence, by pa. 389 Emerson's Flux. or pa. 81 Saunderson's Flux. we have  $68444 \times \log. \text{ of } 2.104 = 22110$  feet or 4 miles nearly, the height required.

*Ingenious solutions were also given by Messrs Burrow, Campbell, Cock, Dalton, Fleck, Hornby, Howard, Jackson, Philarithmus, Retheram, Rowe, Saul, Scholefield, Terril, and Whitehouse.*

# XI QUESTION 858 answered by Mr Wm Simpson Junr, of Bath.

Let AB be the given line. Make  $BE \perp AB$ , and take  $AB^2$  to  $BE^2$  in the given ratio; apply BC the side of a square equal to the given rectangle, and draw  $CD \parallel BE$ ; so shall D be the point required.



For by sim. triangles,  $AD^2 : DC^2 :: AB^2 : BE^2$ ; but  $DC^2 = BC^2 - BD^2 =$  the given rect.  $- BD^2$ ; therf.  $AD^2 : \text{the given rect.} - BD^2 :: AB^2 : BE^2$ , that is in the given ratio by construction.

*Note 1.* The rectangle must not be given less than the square on the perpendicular from B to AE. And when BC is less than BE, there will be two points D answering the question.

*Note 2.* This problem is the same as, "Given, in a plane triangle, the base, one side, and the ratio of the perpendicular to the alternate segment."

*Geometrical solutions were also given by Messrs Amicus, Aspland, Burrows, Cansfield, Dalton, Ryley, Sanderfon, Wirksworthiensis, and White.*

## *Algebraically by the Rev. Mr L Evans.*

Let  $a =$  the given line,  $c^2 =$  the given rectangle, and  $m$  to  $n$  the given ratio; also  $x =$  the one part, then is  $a - x =$  the other part. Hence  $x^2 : c^2 - a - x^2 :: m : n$ ; therefore

$$x^2 - \frac{2am}{m+n}x = \frac{c^2 - a^2}{m+n}m, \text{ and } x = \frac{am \pm \sqrt{m^2 + mn \cdot c^2 - mna^2}}{m+n}.$$

*Algebraical solutions were also given by Messrs Cavill, Clement, Cock, Craven, Cullyer, Cunliffe, Dowden, Gooch, Hall, Jackson, Philarithmus, Rowe, Sampson, Terril, Thompson, and Young.*

## XII QUESTION 859 answered by Mr John Farey.

It is proved by the writers on hydrostatics that the pressure of fluids on the bottoms of their containing vessels (of whatever form), is equal to the pressure of a cylinder, whose base is the bottom of the vessel, and height the perpendicular height of the fluid. Therefore the excess of pressure on the bottom of conical vessels, above the absolute weight of the fluid, must be exerted upwards against the vessel; and when this becomes greater than the weight of the vessel, the fluid will escape at the bottom; therefore the greatest quantity of fluid such a vessel is capable of containing, must be when the excess of pressure is equal to the

weight of the vessel. This being premised, let  $x = KL$  the depth of the quicksilver when the vessel contains the most possible,  $a = .7854$ ,  $n = 8.101753$  oz the weight of a cubic inch of quicksilver, and  $m = 5.208369$  oz ditto of the copper. By a well known theorem in mensuration

$$\frac{x^2 + 2^2 + 1 \times 2 \times x}{3} = 14a \text{ the inner solidity and}$$

$$\frac{x^2 + 2^2 + 1 \times 2 \times x}{3} = 15.86a \text{ the outer ditto,}$$

therefore  $1.86a =$  the solidity of the copper,  
and  $1.86am =$  its weight.

Again, by sim. triangles,  $2 - \frac{1}{2}x =$  the diam. MN, therefore by the same theorem the solidity of the fluid FMNG will be

$$2^2 + 2 - \frac{1}{6}x^2 + 2 \times 2 - \frac{1}{6}x \times \frac{1}{2}ax \text{ or } 4ax - \frac{1}{3}ax^2 + \frac{1}{108}ax^3; \text{ also the}$$

$$\text{solidity of the cylinder FOPG is } 4ax \text{ } \circ \text{ } \circ$$

$$\text{their difference is } \frac{1}{3}ax^2 - \frac{1}{108}ax^3$$

$$\text{and its weight } \frac{1}{3}anx^2 - \frac{1}{108}anx^3.$$

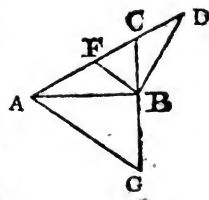
Putting these weights equal, gives  $1.86am = \frac{1}{3}anx^2 - \frac{1}{108}anx^3$ ;

hence  $x^3 - 36x^2 + 200.88 \frac{m}{n} = 0$ , and  $x = 1.94739$  inches, the depth of the quicksilver. Then the greatest quantity of the quicksilver or  $4ax - \frac{1}{3}ax^2 + \frac{1}{108}ax^3$  is  $= 5.17879$  cubic inches; and its weight  $41.9573$  oz avoirdupois.

*Ingenious answers were also given by Messrs Amicus, Dalton, Hellins, Ryley, and Simpson. And several others attempted answers, but they were not right.*

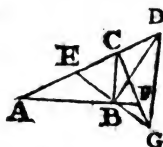
### XIII QUESTION 860 answered by Mr John Ryley, of Beeston.

Draw  $BF \perp BD$ , so shall  $FD = AB$ . Produce  $CB$  till  $CG = CA$ , and join  $AG$ . Then because the triangles  $CBF$ ,  $CGA$  are isosceles, and the  $\angle C$  common,  $AG \parallel BF$ , and consequently the triangles  $DBF$ ,  $ABG$  equiangular, therefore  $AG : AB :: AB (FD) : BD$ , and since  $AB$  is the radius of the circle about the pentagon whose side is  $AG$  by quest. 843, therefore  $BD$  is the radius to the side  $AB$ . Q. E. D.



*The same by Mr John Sampson, Schoolmaster at Old-Hutton, near Kendal.*

Draw  $EBG \perp BD$  and  $CFG \perp AD$ , and join  $DG$ . Then is  $DE = AB$ , or  $CB = CD = CE$ , and conseq.  $GD = GE$ . The angles  $ACB$ ,  $CFB$  being equal, their supplements  $BCD$ ,  $BFG$  are equal; again by taking the  $\angle EBC$  from the right angles  $ABC$ ,  $EBD$ , there remains the  $\angle CBD = ABE = FBG$ ; hence the triangles  $CBD$ ,  $FBG$  are similar, and since  $AB = 2BC$ , and  $BC = 2BF$ , theref.  $BD = 2BG$ . Lastly, since  $BG$  is  $\perp BD$  &  $= \frac{1}{2}BD$ , and  $GE = GD$ ,  $ED$  is the side of a pentagon inscribed in a circle of which  $BD$  is the radius, by quest. 11 last year; but  $ED = 2BC = AB$ ; therefore  $AB$  is the side of a pentagon inscribed in a circle of which  $BD$  is the radius. *Q. E. D.*



*Answers to this question were also given by Messrs Amicus, Aspland, Burrows, Cawil, Clement, Dalton, Dowden, Herward, Ker, Pkilarithmus, Rowe, Sanderfon, Waugh, and Young.*

#### XIV QUESTION 861 answered only by the Proposer Amicus.

Let  $s$  = the sum of the proposed series,  $q$  = the length of the quadrant of a circle to the radius unity; then it is well known that  $ca = 2q$ , and multiplying the series by  $ca$  we obtain  $c = \left\{ \frac{a}{2} + \frac{c}{2.4} - \frac{3.3a}{2.4.6} + \frac{5.5c}{2.4.6.8} - \frac{3.3.7.7a}{2.4.6.8.10} + \frac{5.5.9.9c}{2.4.6.8.10.12} - \frac{3.3.7.7.11.11a}{2.4.6.8.10.12.14} + \&c. = 2qs. \right.$

Now  $\frac{x^{\frac{3}{2}}}{x^{\frac{1}{2}} \sqrt{1-x^2}} = \frac{x^{\frac{3}{2}} - 3x^{\frac{3}{2}}x}{\sqrt{1-x^2}} + \frac{3x^{\frac{3}{2}}x}{\sqrt{1-x^2}}$ , { and when  $x = 1$ , the fluent of the first member of this = 0, and  $\int \frac{x^{\frac{3}{2}}x}{\sqrt{1-x^2}}$  is  $= \frac{c}{3}$ ; } in like manner the conseq. the whole fluent of  $\int \frac{x^{\frac{3}{2}}x}{\sqrt{1-x^2}}$  is  $= \frac{c}{3}$ ; } whole fluent of  $\frac{5x^{\frac{3}{2}}x}{\sqrt{1-x^2}} =$  that of  $\frac{7x^{\frac{7}{2}}x}{\sqrt{1-x^2}}$ , whence that of  $x^{\frac{7}{2}}x \times \frac{1}{1-x^2} - \frac{1}{2} = \frac{5c}{3.7}$ , that of  $x^{\frac{11}{2}}x \times \frac{1}{1-x^2} - \frac{1}{2} = \frac{5.9c}{3.7.11}$ , of  $x^{\frac{15}{2}}x \times \frac{1}{1-x^2} - \frac{1}{2} = \frac{5.9.13c}{3.7.11.15}$ , &c. Again, that of  $\frac{3x^{\frac{3}{2}}x}{\sqrt{1-x^2}}$  or of  $\frac{3x^2x - (x^4x + x^4x)}{\sqrt{x^3 - x^5}}$  = that of  $\frac{5x^{\frac{5}{2}}x}{\sqrt{1-x^2}}$ ; hence that of  $\frac{x^{\frac{5}{2}}x}{\sqrt{1-x^2}} = \frac{3a}{5}$ , that of  $x^{\frac{9}{2}}x \times \frac{1}{1-x^2} - \frac{1}{2} = \frac{3.7.a}{5.9}$ , of  $x^{\frac{13}{2}}x \times \frac{1}{1-x^2} - \frac{1}{2} = \frac{3.7.11a}{5.9.13}$ , &c. Whence,

dividing the first term of the series above, by  $c$ , the second term by  $a$ , the third by  $\frac{c}{3}$ , the 4th by  $\frac{3a}{5}$ , the 5th by  $\frac{5c}{3 \cdot 7}$ , the 6th by  $\frac{3 \cdot 7 a}{5 \cdot 9}$ , &c. it becomes

$$1 = \frac{1}{2} + \frac{3}{2 \cdot 4} - \frac{3 \cdot 5}{2 \cdot 4 \cdot 6} + \frac{3 \cdot 5 \cdot 7}{2 \cdot 4 \cdot 6 \cdot 8} - \frac{3 \cdot 5 \cdot 7 \cdot 9}{2 \cdot 4 \cdot 6 \cdot 8 \cdot 10}, \text{ \&c.} = \frac{x}{1+x} - \frac{1}{2}$$

when  $x=1$ ; consequ. multiplying the second term of this last series by  $x$ , the third by  $x^2$ , the 4th by  $x^3$ , the 5th by  $x^4$ , &c. it is manifestly

$$\div \frac{x}{1+x} - \frac{1}{2} \text{ and since the series above is no more than this } \times \frac{x}{2 \frac{1}{2} \sqrt{1-x^2}}$$

and the whole fluent taken, its sum is therefore equal to the whole fluent

of  $\frac{x}{x \frac{1}{2} \sqrt{1-x^2} \sqrt{1+x}}$ , which by form the 60th of *Cotes's Harmonia* Mensurarum is  $q \sqrt{2} = 2q$ s above, consequently  $s = \sqrt{\frac{1}{2}}$  = the sum of the proposed series.

### XV OR PRIZE QUESTION 862 answered by Amicus.

Allowing a cubic foot of cast iron to weigh 7200 oz, and that it is 6000 times heavier than air, the diameter of the ball will be .46702 parts of a foot; and applying these numbers to the theorems, at art. 365 of Mr Simpson's Fluxions, we have, putting  $D$  = the ball's diameter,  $\frac{2}{3} D \times 6000 = 16000 D = d$  the space that might have been uniformly described by the ball in vacuo, whilst its motion is destroyed by the resistance of the medium alone uniformly continued, and if  $b = 32 \frac{1}{8}$  the force of gravity; then  $\{a = \text{the greatest velocity that could possibly be acquired in falling } \sqrt{16000 D b} = \text{feet } 490 \cdot 2646 \text{ per second, the height of the ascent } 7265 \cdot 808, \text{ the time of ascent } 18'' \cdot 027, \text{ time of descent } 24'' \cdot 807, \text{ and the velocity acquired in the descent } 453 \cdot 85 \text{ feet per second. There is not the least doubt of the truth of these theorems, provided the value of } d \text{ or } a \text{ be at first rightly ascertained; that here given is agreeable to all the English, and to Mr Daniel Bernoulli, and many other foreign mathematicians. But Mr John Bernoulli (Daniel's father), considering the air as an elastic medium with small interstices between the particles, determines } d = 4000 D, \text{ and } a = 245 \cdot 1323 \text{ s and then the height ascended comes out } 3004 \cdot 84, \text{ time } 10'' \cdot 43477, \text{ time of descent } 17'' \cdot 46433, \text{ and the acquired velocity } 240 \cdot 1725. \text{ For a second hypothesis, he supposes the particles to be non-elastic, and then } d = 8000 D, a = 346 \cdot 6697, \text{ height } 4788 \cdot 946, \text{ time of ascent } 13'' \cdot 89778, \text{ of descent } 21'' \cdot 0697, \text{ and } 333 \cdot 0503 \text{ the velocity thereby acquired. His theorems differ from Mr Simpson's in form only, the variation arises wholly from } d, \text{ the determination of which, depending on the internal properties of the medium, is doubtful.}$

*True and ingenious solutions were also given by Messrs Aspland, Cock, Culler, Dalton, Dodden, Faroy, Gould, Howard, Scholefield, and Terril.—Other answers were attempted, but they were not right.*



## NEW QUESTIONS.

## I QUESTION 863, by Mr. J. Hunt, of Stony Stratford.

FROM the following equations, dear Gents, will appear,  
An ornament greatly becoming the fair.

$$x + y + z = 20$$

$$x + 2y + 3z = 53$$

$$x^2 + y^2 + z^2 = 260$$

## II QUESTION 864, by Juvenis.

In Hawney's Mensuration, and Breaks's Surveying, the multiplier for finding an undecagon, is 8.51425, and for a duodecagon 9.330125, which last number Hawney has pretended to find.—Now as I know some teachers who use these numbers, and who persist in their being right, I hope it will not be thought below Lady Di's notice, for the sake of young Tyros who may be led into error, to rectify the mistake, as she has ever stooped to utility, though dressed in ever so humble a garb.

III QUESTION 865, by Mr Isaac Saul, of Holland  
near Wigan.

Required a general rule for determining the legs of a right-angled triangle, having given the radius of its circumscribing circle, and the distance of the centers of its circumscribed and inscribed circles.

## IV QUESTION 866, by Mr Wm Penn jun, of Chalfont.

If a lever of dry oak, in the form of the frustrum of a square pyramid, the length being 30 inches, each side of the greater end 6 inches, and each side of the less end 3 inches, rest upon a prop at 3 inches from the smaller end; it is required to find what weight must be fixed to the extremity of this end, to keep the larger end in equilibrio.

V QUESTION 867, *by Mr John Aspland, of Sobam.*

A smith, unskilled in mechanics, undertook to make a steelyard, to weigh hay and other large weights; and having first made his beam hang in equilibrio by a fixed weight behind the center of motion, (so that it may be considered as without weight) he began his divisions from the said center, and graduated the beam into 59 equal divisions, each division, with a weight of 118lb, weighing, as he supposes, 112lb; at the 29th division he adds 125lb to his former weight, which he then finds upon trial to weigh exactly 60cwt; and with this weight he supposes each division now weighs 2cwt, that is, at the 30th division 62cwt, at the 31st 64cwt, and so on to 90cwt, which consequently he supposes to fall upon the 44th division. It is required to shew how much the said steelyard errs from the truth at every division both with the small and large weight.

VI QUESTION 868, *by Mr Todd of Darlington.*

To determine the least semi-parabola that can circumscribe a given circle.

N. B. This question has been proposed before elsewhere; but it is here re-proposed on account of a dispute which has been held for some time concerning it.

VII QUESTION 869, *by Mr Jas Williams, of Plymouth Dock.*

On a certain day in the autumnal quarter, at 10 o'clock in the forenoon, in the latitude of  $50^{\circ}$  north, the sum of the sun's altitude and declination was  $34^{\circ} 40'$ . Required both the altitude and declination, or day the observation was made.

VIII QUESTION 870, *by Jacobus de Viredi Sylva.*

Suppose I throw a stone into a well, and that I observe a pendulum of 12 inches long make 20 vibrations from the moment of dropping the stone to the return of the sound from the bottom to my ear. Required the depth of the well.

IX QUESTION 871, *by Mr Isaac Dalby,*

In a spherical triangle there is given the vertical angle, the perpendicular, and the perimeter or sum of the degrees in all the sides; to determine the triangle by stereographic projection.

## X QUESTION 872, by Mr Wm Goock, of Harlston School.

Suppose that on the diameter of a semicircle there be formed two quadrants, having their radii each equal to that of the semicircle, and their centers on the extremities of the said diameter, so that the arcs may meet each other in the center of the semicircle. It is required to find the dimensions of the greatest parabola that can be inscribed in the curvilinear space formed by the arcs of the semicircle and the two quadrants.

## XI QUESTION 873, by Mr Geo Sanderfen, of London.

The shortest method, that I know of, for reducing the observed distance of the moon and sun, or moon and fixed star, to the true, by log. sines and tangents only; is by the following rules:

RULE 1. To the apparent distance of the moon and sun, or moon and star, add the difference of their apparent altitudes, and take half the sum: also from the apparent distance subtract the difference of the apparent altitudes, and take half the remainder.

2. Add together the log. sines, of this half sum, of this half remainder, of the true zenith distances, and the arithmetical complements of those of the apparent zenith distances (or their log. cosecants); and take half their sum.

3. From this half sum of the six logs. subtract the log. sine of half the difference of the true zenith distances, and the remainder is the log. tangent of an arc; the log. sine of which arc subtracted from the said half sum of the six logs. leaves the log. sine of half the true distance.

Required the investigation.

## XII QUESTION 874, by Mr John Gould, of Spalding.

It is proposed to exhibit the fluent of  $y\dot{x} - x\dot{y} \times y = a\dot{x}^2$  in finite terms.

## XIII QUESTION 875, by Mr Alex Rowe, of Reginnis.

It is required to find the diameter of a circular parachute; by means of which a man of 200lb weight may descend, from a balloon at a great height, with the uniform velocity of only 10 feet in a second of time. The parachute being supposed to be made of such materials, and thickness, that a circle of it of 50 feet diameter, weighs only 150lb.

## XIV QUESTION 876, by Amicus.

If from three given points, not in the same right line, three lines be drawn to terminate in the same point, so, that the rectangle under two of them may be equal to the square of the third; to find how many, and what different species of curves, may be the loci of this terminating point; and under what particular variation of the positions of the given cases.

## XV, or PRIZE QUESTION 877, by Plus Minus.

In the year 1717 Mr Stirling published an illustration of Sir I. Newton's *Enumeratio Linearum tertii Ordinis*, and in it added four new curves to the catalogue, viz. 1. A redundant hyperbola with one diameter, and consisting of an unscrubed and two ambiguous hyperbolas with an oval. 2. The same with a conjugate point. 3. A redundant hyperbola with three diameters and an oval. 4. The same with a conjugate point. After this Mr E. Stone published his *Mathematical Dictionary*; and in it, under the article *curves*, he says that he himself has discovered two more curves of this order, omitted by Newton, amongst the deficient hyperbolas denoted by the equation  $xy^2 = bx^2 + cx + d$ , viz. 1. When the equation  $bx^2 + cx + d = 0$  has two unequal negative roots. 2. When it has two equal negative roots. As no notice has been taken of any of these discoveries in the future editions of the *Enumeratio*, it is required to determine whether they have any existence or not, and if they have, to give an example of an equation for each.

\* \* The prizes have been determined by lot, as follows: First, for the prize question, to Mr John Farey and Mr Gould, each 20 diaries — 2dly, for the prize enigma, to Mr J. Aspland and Miss F Cof North Shields, each 2 diaries. — 3dly, for the general answers of the enigmas, to Mrs Elizabeth Paufer and to Miss Emily Rivers, each 8 diaries. — 4thly, for the rebuses, &c. to Mr William Bearcroft and Miss Sarah Walker, each 6 diaries. All of whom will please to send for them to Mr R. Horsfield, Stationers Hall.

N. B. All other letters containing any matter for the use of the diary, to be directed thus, "For the Ladies' Diary, Stationers Hall, London."

Letters from the following persons came to hand after the diary was composed, viz. Archimedes, Geo Clayton, schoolmaster, W. M. of Beverley, and Mr Maton Tweddale, of Stone Rigg.

F I N I S.